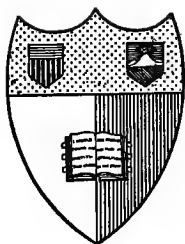


ECONOMIC CONDITIONS
IN THE
PHILIPPINES

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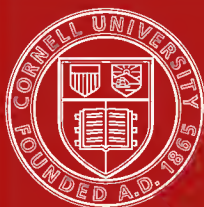
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ECONOMIC CONDITIONS IN THE PHILIPPINES

BY

HUGO H. MILLER

FORMERLY CHIEF, INDUSTRIAL DIVISION
BUREAU OF EDUCATION, MANILA

REVISED EDITION

GINN AND COMPANY

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PREFACE TO THE FIRST EDITION

This book is written for beginners in the study of economic conditions in the Philippines. Its object is to explain the economic position of the Filipinos in their own Islands and in the world in general, and to state, analyze, and discuss economic conditions found here. Theoretic economics enter into this discussion only as subordinate to and explanatory of actual fact. It is believed that this study will give to students an idea of actual economic conditions existing in the Philippines and a comparative idea of those found in other countries, and at the same time will result in a knowledge of the natural laws upon which all economic discussion and reasoning must be based.

Throughout the book the data obtained from special economic reports by teachers are presented in collective form. For reference purposes, information which warrants special notice is credited to the teacher who furnished it.

I am also indebted to the following persons for reviewing the portions of the manuscript which treat subjects in which they are particularly interested. From the Bureau of Agriculture: Mr. Otis W. Barrett, Chief of the Division of Experiment Stations; Mr. P. J. Wester, Horticulturist; Mr. M. M. Saleeby, Fiber Expert; and Mr. C. M. Connor, Chief of the Agronomy Division. From the Division of Ethnology, Bureau of Science: Dr. M. L. Miller, Chief; Mr. H. Otley Beyer and Mr. E. B. Christie. Dr. James A. Robertson, Librarian, Philippine Library; Father José Coronas, Assistant Director, Weather Bureau; Mr. W. L. Gorton, Chief of the Irrigation Division, Bureau of Public Works. In addition I have had

the coöperation of several persons in the Bureaus of Education, Customs, Internal Revenue, Science, and Public Works. The data furnished by Mr. Conrado Benitez of the University of the Philippines, Mr. Herbert W. Krieger, of the Philippine School of Commerce, and others are also duly acknowledged in the proper places.

The manuscript was reviewed at the University of California by Professors David P. Barrows, Carl C. Plehn, and H. R. Hatfield, and at The University of Chicago by Professor Paul J. Goode.

Books which were consulted and from which extracts are taken are mentioned in the text or in footnotes.

H. H. M.

PREFACE TO THE REVISED EDITION

Changes in the course of study have necessitated the addition of more commercial geography and theory of economics to this text. The book now becomes an outline for the entire course in commercial geography and economics in the fourth year of the high school.

Economic facts as they relate to conditions in the Philippines are presented rather fully in the text. The material in commercial geography and economic theory is especially emphasized in the suggestions for review and original work by references to original sources and to textbooks.

It is generally recognized that in an elementary high-school course in economics the maximum of facts and the minimum of theory is desirable. Nevertheless, theory is the course of least resistance for both teacher and pupils. Facts are hard to find, difficult to apply, and less susceptible to discussion than theory. The author hopes that the suggestions at the end of each chapter will be sufficient to point the way, and that the teacher will use his own initiative in having them applied to local conditions. One good original report by the pupil is, in the opinion of the author, far more profitable than the discussion of unapplied theory. A well-directed discussion of an economic condition of fundamental insular or local importance will result in a better grasp of the subject of economics than the elaboration of intangible theory. The theory should be applied, else the subject will soar far above the heads of the pupils, and the objects of the course will not have been attained.

The book has been revised in this spirit and with the hope that the course can everywhere be made a live and interesting one.

Facts have been brought down to the year 1919, which date probably marks a new phase in the economic development of the Philippines.

For assistance in the preparation of this edition I am especially indebted to Mr. John W. Osborn, Chief of the Academic Division, Bureau of Education; Dr. Stanton Youngberg, Chief Veterinarian, Mr. Don D. Strong, Chief of the Fiber Division, Mr. Silverio Apostol, Chief of the Plant Industry Division, and Mr. Antonio Peña, Chief of the Statistical Division, Bureau of Agriculture; Mr. Francis B. Mahoney, Chief of the Commercial Intelligence Division, Bureau of Commerce and Industry; the Directors of the Bureau of Labor and of the Bureau of Commerce and Industry for typed copies of their reports; the Director of the Census of 1918; Professor Kenneth Duncan and Professor C. F. Remer of the Departments of Economics in Canton Christian College and Saint John's University, Shanghai, respectively.

H. H. M.

FOREWORD TO THE FIRST EDITION

In accordance with the present purpose of the Bureau of Education to adapt its instruction as closely as possible to the life needs of the people of the Philippines, a course has been introduced into the high-school curriculum embodying a half year of physical geography, a half year of commercial geography, and a full year's study of economic conditions in the Philippines.

This book is to serve as the text in the subject of economic conditions in the Philippines in the fourth year of the secondary course. It is not a theoretical treatise on economics; it rather represents a study of everyday facts with which all young men have to do who are engaged in any useful occupation in this country. In the last year of his school work, instead of devoting himself to purely academic studies, the pupil assimilates a body of information which tends to lead him into intelligent and useful citizenship. This is one of the richest and most interesting fields of investigation open to the Filipino student; it is a new field; it has never been covered heretofore in any adequate way, though all the facts involved have a direct bearing on the industrial and social welfare of the Filipino people.

The preparation of this book has involved many months' work by a large number of well-qualified persons. The dearth of publications on the various subjects considered has necessitated the gathering of original information from all parts of the Islands, and on this task approximately one hundred and twenty American and Filipino teachers have been employed. Under date of March 1, 1912, an outline prepared

by Mr. Hugo H. Miller was sent out by the Director of Education to these collaborators throughout the Islands. The outline took up in detail various subjects treated in this book, and by questions and suggestions presented a plan for a report on the economic conditions found in each district. Selected supervising teachers and special high-school teachers were engaged on this work. The nature of their ordinary duties is such that these persons must have a thorough understanding of the social and economic complexions of the communities in which they are working; they are better fitted than any other class of persons to furnish information of this character. The reports submitted are voluminous and in most cases exhaustive and accurate.

In the writing of this textbook Mr. Miller has had at his disposition all the data accumulated by the Bureau of Education in the working out of the program referred to above. He has brought to this task a breadth of view and a maturity of judgment resulting from several years' study of these problems from the vantage point of a supervisory position in the industrial department of the Bureau of Education.

Mr. Charles H. Storms, Instructor in the Philippine Normal School, was temporarily assigned to the General Office of the Bureau of Education to assist in the preparation of this book. He compiled material from the special economic reports, collected and arranged data, criticized the manuscript and general contents, and wrote the chapter on sugar.

The completed text is an original and valuable treatise on a vital subject, and as the facts here presented are digested by the many hundreds of pupils who will devote themselves to their study, the book may well prove to be one of the effective agencies in the material upbuilding of the Philippines.

FRANK R. WHITE
DIRECTOR OF EDUCATION

REFERENCES

Required Supplementary Text:

Bullock's "Elements of Economics."

Required Reference Texts, of which several copies should be available in the library:

Miller's "Commercial Geography," "The Materials for Commerce for the Philippines."

Toothaker's "Commercial Raw Materials."

Brigham's "Commercial Geography" (edition of 1918).

Finch and Baker's "Geography of the World's Agriculture" (Department of Agriculture, Washington, D. C., 1917).

Bishop and Keller's "Industry and Trade."

Miller and Polley's "Intermediate Geography."

Additional References:

Statistics on principal crops of the Philippine Islands (issued annually in photographic form by the Bureau of Agriculture and obtainable on request through the proper channels).

Statistical Abstract of the United States.

The Philippine census of 1903 and the census of 1918.

The World Almanac.

Annual Report of the Director of Agriculture.

Annual Report of the Director of Education.

Annual Report of the Director of Health.

Annual Report of the Insular Collector of Customs.

Annual Report of the Director of Public Works.

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Annual Report of the Collector of Internal Revenue.

Annual Report of the Director, Bureau of Labor.

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The Philippine Agricultural Review.

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ECONOMIC CONDITIONS IN THE PHILIPPINES

PART I. INTRODUCTION

CHAPTER I

PRIMITIVE AND CIVILIZED PEOPLES

Approximately seven eighths of the population of the Philippines belong to a civilized people known as the Filipinos. It is with them that this book primarily deals.¹ However, the primitive and semicivilized tribes, which make up the other eighth, offer excellent examples of various stages of economic advancement from one of the lowest known conditions of the human race up to the present plane achieved by the Filipinos. It is therefore proper to begin a study of economic conditions in the Philippines with a short discussion of certain typical primitive and semicivilized tribes. The economic systems and ideas of these tribes are so simple as to be readily understood, and a study of them prepares the way for a comprehension of more complicated systems and ideas of civilization. Moreover, the trading operations of these tribes with the Filipinos are of considerable commercial importance.

¹ The names by which various groups, tribes, and divisions of peoples in the Philippines are designated are very loosely used. Strictly speaking, the term "Filipino" applies to all Malayan natives of the Philippine Islands. Popular usage, however, tends to limit the term to the eight Christian peoples, and within the covers of this book that usage will be followed. By the term "Filipinos," as used here is meant civilized Christian Malayan natives of the Philippine Islands.

THE NEGRITOS

The most primitive people of the Philippines are the Negritos.¹ Most of them are found in the hills and mountains of several of the larger islands and on a few of the smaller ones. They probably do not exceed thirty thousand in number. These people belong to the black race. They have a dark skin, kinky hair, thick lips, and flat nose. They seldom exceed five feet in height, and are usually under that measurement. They live in groups varying from one family to several scores of persons. In most instances contact with more advanced peoples has changed their original mode of living, but many of them still follow the primitive existence which has been theirs for centuries.

The chief and almost sole aim of the Negritos is food. Their method of obtaining it is such that they keep only a small supply or none at all. They make small plantings of camotes, corn, and squash, but beyond this they usually have no idea of providing for the future needs of their stomachs, feeling that they can find food when necessity demands. The most primitive Negritos depend principally on the chase as the chief means of securing food, and to a less extent on fresh-water fishing. The men are the hunters. Their implements are bows and arrows, spears, blowguns, traps, nets, and bolos. They are assisted in the hunt by dogs, their only domestic animal. The women sometimes take the place of the dogs in rousing the quarry. When they kill a deer, they make a definite division of the carcass. The man who first wounded the animal receives the head and breast; the backbone is given to the man who discharged the fatal shaft; one hind quarter is given to the owner of the dogs that roused the deer; and the remainder is divided among the other hunters. If a family kill a deer or a boar, "they halt at the spot where the animal has fallen, scoop a hole in the

¹ See "The Negritos of Zambales," by William Allen Reed, Bureau of Science, Manila.

ground, place the animal in it, and build a fire. Each of them takes the piece of the animal that suits his taste best, and roasts it at the fire. They go on eating until they have filled their bellies; and when thus satiated, they sleep. . . . When they awake, they go through the same operation, and so on until all the meat is devoured; then they set out on the hunt again.”¹

While the meat thus obtained in the chase is the chief food of most Negritos, they have vegetable food also. Much of this is found in the forest in the form of roots. A small amount is obtained through cultivation in kaingin.² The ground is roughly cleared, and rice, corn, squash, and sweet potatoes are planted. Among the most primitive people a few rude shelters are erected near this clearing while the crop matures; but such settlements are not permanent, and when once the food from the kaingin has been consumed, they wander off. Indeed, it sometimes happens (as in case of death) that they leave before the crop matures. Hunting, as we have seen, is the province of the men. They also assist in planting; but cultivation is left almost entirely to the women and children. The implements used in agriculture are sharp-pointed sticks, with which holes are made for the seeds. Bolos are also employed for various purposes.

The clothing of the Negritos is very simple. The most primitive form is made from beaten bark. The men wear a breechcloth. The women sometimes use this garment, but generally wear a short skirt.

The Negritos have simple implements to help them in procuring and preparing food. They use pointed sticks for agriculture, and make arrows, blowguns, and nets for the chase. They obtain fire with the flint and steel, or by rubbing together two pieces of bamboo. They cook in green

¹ See Buecher's "Industrial Evolution," p. 9. This is a quotation from A. Schadenberg in the *Ztschr. f. Ethnologie*, XII (1880), 143-144. Probably no Negritos now exist who do not cultivate crops in kaingin.

² Temporary clearings.

bamboo tubes or in pots obtained by trade. They have bamboo combs and seed necklaces for ornament, and bamboo musical instruments for enjoyment.

Migrating as they do from place to place, the most primitive Negritos accumulate but few articles. Bows and arrows, blowguns, traps, nets, and dogs they take with them. The meat of wild animals, the wild roots, and the product of their clearings they must consume on the spot. Permanent results



A NEGrito SHELTER

of labor which cannot be easily transported, such as substantial houses, coconut palms, and fruit trees, are of no interest to the Negritos. In addition to providing themselves with the simple forms of food and rough implements and ornaments, many groups of them have been able to acquire articles of iron and steel (bolos and spears). The cotton cloth which they use is obtained from the lowlanders, in exchange for forest products. The life of the Negritos may be summed up as one continuous search for food.

THE SUBANUNS

The Subanuns are a pagan Malayan tribe of the Zamboanga Peninsula in Mindanao.¹ As with the Negritos, but to a less degree, the chief aim in life of the Subanuns is food. Unlike the Negritos, however, they ordinarily secure their food through agriculture, and only resort to forest products when their crops fail. They follow the kaingin system. In the clearings they plant rice, sweet potatoes, corn, millet, yams,



PLANTING RICE IN A KAINGIN

tobacco, vegetables, bananas, papayas, and betel vines. The Subanuns are not naturally of a roving disposition, but their implements of agriculture are not such as to enable them to cultivate the same clearings year after year. As soon as the ground hardens and the cogon grass obtains a foothold, their pointed sticks are useless, and they find it easier to abandon their fields and clear others. This does not mean that they leave the locality immediately. So long as there is new forest

¹ "The Subanuns of Sindangan Bay," by Emerson B. Christie, Bureau of Science, Manila.

suitable for clearing, they remain. But feeling the ultimate necessity of leaving, they do not plant long-time crops, such as coconut palms, areca palms, and the like (although they greatly enjoy the products of these), nor do they build houses of a substantial character. A Subanun family seldom remains in the same spot for more than ten years; the time is usually much shorter.

In clearing the ground different families of the community coöperate. In cultivating the clearing the men of the family to which the land belongs make holes with sharpened sticks, and the women and children follow, planting the seeds. Weeding is done twice, but the crops receive little cultivation.

Although the Subanuns do but little hunting and fishing, they have a supply of meat in the two domestic animals, the pig and the chicken. They understand the fermentation of rice, and make a rice beer.

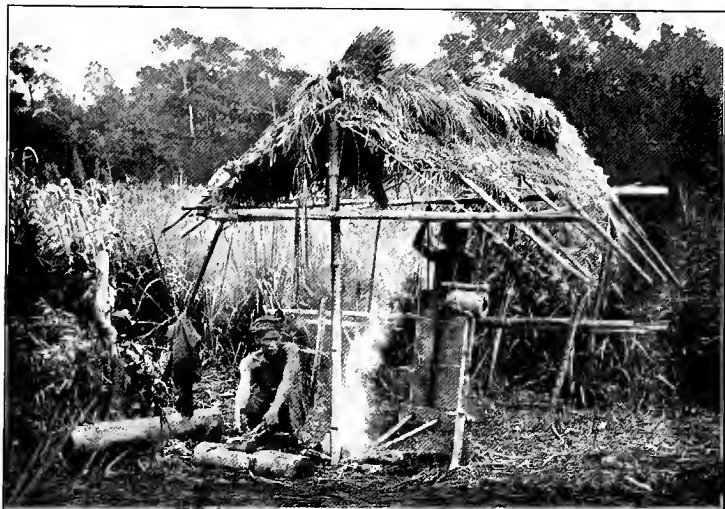
The clothing of the Subanuns is made from cotton and abaca¹ cloths. The men wear trousers and shirts, the women waists and skirts. Turbans are worn by both sexes. For ornament they wear silver trinkets, beads, earrings, necklaces of dried seeds, brass anklets and armlets, wristlets made of shells and silver, rings and earrings of wood, coconut shells, seashells, horn, and brass, as well as bamboo combs, many of these being obtained by trade.

For shelter the Subanuns build houses of one room, on wooden supports. They make the floor of split bamboo, palm, or wood, and the rest of the house of bamboo and light materials, such as the leaves of nipa, buri, sago, and other palms. The space beneath the floor they give to the pigs and the chickens. In the houses they have mats of pandan or palm leaves. Their bedding consists of a few strips of cotton cloth. They also have baskets for storing food, pottery obtained by trade, brass gongs, and Chinese jars secured through barter with the Moros.

¹ *Musa textilis*, Manila hemp.

The Subanuns build rice granaries, which consist of large baskets erected on a platform and protected by a roof. In this way they store food to meet the future needs of their stomachs, and thus they are not at the mercy of the vagaries of nature.

They carry on manufacturing in a rude way. Pottery is made by women. The clay is formed by means of a stone, a stick, and the hand. The pot is first baked in the sun and



A PRIMITIVE SMITHY

then in a hot fire. These crude articles are often objects of trade. Coarse and unornamented baskets are made of nito,¹ rattan, bamboo, and wood. The garments of the Subanuns are made from cloth of their own weaving. They understand the distaff and the spinning wheel, but the cotton which they use they obtain from the Moros, from whom they buy cotton yarn also. The abaca is a home product. The looms are crude. The Subanuns understand working in iron. They use as tools bamboo bellows, an anvil (a piece of iron placed on

¹ The stems of climbing ferns (species of *Lygodium*).

a block of wood), and a hammer. The raw material they obtain by trade, and turn it into chopping knives and a few weapons. From bamboo and wood they make musical instruments, rings, and combs. Palm and pandan leaves they weave into mats.

The Subanuns have been elevated to a higher plane of civilization by barter with the Moros, who are much more advanced. The Subanuns barter mountain rice, wax, resins, and rattan for cotton fiber, yarn, and cloth; for weapons; for brass boxes, jars, trays, gongs, and ornaments of various kinds; and for Chinese jars. The Moro traders arrive in boats. The Subanuns come down from the hills, bringing their products on their backs, since they have no beasts of burden, vehicles, or boats. Sometimes, however, they use rafts on the river. In their transactions the Subanuns are often badly cheated by the Moros.

The articles with which the Negritos are familiar are few, but those found among the Subanuns are much more numerous. Of daily use among the Subanuns are houses and food (rice, sweet potatoes, garden vegetables, wild and domestic meats, fish, and the like), clothing of coarse cotton and abaca cloths, crude baskets, and bolos. The implements used in production consist of pointed sticks, bolos, and knives, and the apparatus for ironwork and for spinning and weaving. The products saved for future use are chickens, pigs, rice stored in granaries, and corn stored in baskets. All these articles may properly be called necessities, for, directly or indirectly, they all sustain life or shelter the body. Besides these the Subanuns possess articles which are in no way related to their physical comfort, but which are kept for ostentation and future needs. Such are the personal ornaments of silver, brass, shell, and bamboo, the brass gongs, and the large Chinese jars. Although these do not protect or sustain the body, yet they can be exchanged for wives, food, clothing, or shelter. In particular are the Chinese jars much esteemed, for these are beautiful and useful, and limited in number.

In the following points the Subanuns have surpassed the Negritos: (1) in obtaining a more permanent residence, which would become fixed if their rude cultivation could overcome the hardening of the soil and the weeds; (2) in securing improved methods of obtaining foods, and an increase in quality and variety; (3) in storing up food for the future; (4) in the rude beginnings of pottery, metal work, and weaving; and (5) in the articles of art kept for ostentation and for future needs.

The life of the Subanuns may be characterized as one in which agriculture normally gives a sufficient supply of food and a surplus. The surplus is stored against future want, or exchanged for articles of value.

THE MOUNTAIN PEOPLES

The Igorots, Bontoks, and Ifugaos¹ belong to the most advanced of all the Malayan pagan tribes. They live in the Caraballo Mountains, where the narrow flood plains and the steep hillsides offer but little fertile and arable land. Yet of their various forms of production these people are most advanced in agriculture, a condition which has probably been brought about by their restricted supply of wild foods. They clear the steep hillsides of pine trees, turn the soil with sharp sticks, and plant sweet potatoes, millet, or beans. Such fields are most often entirely dependent on the rainfall for moisture, and are usually abandoned after a few years' use. For their supply of rice these people rely on land made by building terraces on the steep hillsides and filling these with gravel, sand, clay, and soil. This land is usually kept from being washed down the hillside by a thick retaining wall built of

¹ This discussion is based on "The Bontoc Igorot," by A. E. Jenks, Bureau of Science, Manila, the economic report submitted for Ifugao by Roy F. Barton, and verbal information given by H. Otley Beyer, Bureau of Science. The Ifugaos and Bontoks live in subprovinces of the same names; the Igorots live in the subprovinces of Benguet, Lepanto, and Amburayan. Formerly the name Igorot was applied to all these tribes.

stone. Such walls are from fifty centimeters to ten meters in height; in many communities they amount to thousands of linear kilometers.¹ The human labor expended on these terraces is enormous. In places whole mountain sides are covered with terraces which contain thousands of hectares, being the results of generations of toil.

In these fields several methods of irrigation are employed. Sometimes there are canals fed by springs. Sometimes rivers are diverted into canals by means of dams and weirs. Thus the water is brought to the terraces, and flows from plot to plot, over the whole mountain side. This work is done by communal labor, and the water is divided among those who build the system. For small patches, where a flow is not obtainable, water is lifted from rivers by sweeps, or is carried in jars.

The implements of tillage employed by the Igorots and Bontoks are sharpened sticks; the Ifugaos use crude wooden spades. These are effective in ground soaked and softened with water, and the soil is thoroughly broken up. The soil is then puddled with the feet. These people understand the use of fertilizers also, and add pig manure, ashes, grass, and sweet-potato vines to prevent impoverishment of the soil. Every two years they add new soil. The grain is sown thick in a small seed bed; after it has sprouted, it is transplanted into the terraces. The cultivation of the fields is done carefully. Women and children pull the weeds, and thin out the plants. Old women and children protect the crops during the day; at night fires are built to scare away wild hogs. The Bontoks and Igorots make scarecrows, consisting of bunches of leaves, figures of large birds, and the like. These are hung on poles, and are often kept in motion by systems of strings attached to floats in a rapidly moving current.

In the rice harvest four or five cutters reap the grain and place it in bundles for one woman to bind and carry to the transportation baskets.

¹ In Ifugao there are more than 19,000 kilometers of eight-meter wall.



A KAINGIN



RICE TERRACES
ADVANCE IN AGRICULTURE

Rotation of crops is practiced, but not for the purpose of increasing fertility or retarding the exhaustion of the soil; it is rather to make constant use of the land. The best example of this is the planting of sweet potatoes in the terraces after the rice has been harvested.

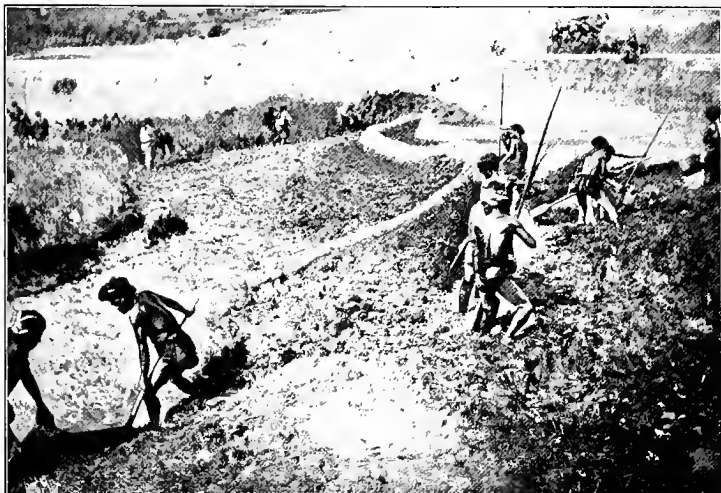
The system of agriculture as a whole is excellent, and such that the mountain people¹ wrest from their barren hillsides a supply of food more than sufficient for their immediate needs. In the villages there are granaries, built of heavy pine planks and timbers, with thatched roofs extending almost to the ground. Here the rice is stored. Corn and millet are kept in the dwellings. Beans are dried and stored in baskets. The Igorots slice, dry, and store sweet potatoes also.

These peoples are fairly well supplied with domestic animals. Horses of good breed are raised, and used for riding and packing. Carabaos and cattle are also raised, but are used neither in agriculture nor in transportation; their flesh, however, like that of the hog, is much appreciated. Hogs are kept in pens; they are fed three times a day, with sweet-potato vines, parings, and green vegetable matter, always cooked. The refuse of the pen is the chief fertilizer. Besides these animals chickens and dogs are raised about the house. The sources of food eaten by the Ifugaos have been calculated by Roy F. Barton, as follows:

FOOD SOURCE	FRACTION OF TOTAL SUBSISTENCE
Agriculture	.84
Primitive food getting	.094
Animal culture	.042
Importation	.024
Total	1.000

The clothing of the men consists of a girdle of bast, rattan, or brass links. This supports a breechcloth, which is made

¹ In this chapter the term "mountain people" refers to the Igorots, Bontoks, and Ifugaos as a whole.



TURNING THE SOIL

Photo by Roy F. Barton



PLANTING

Photo by Roy F. Barton

RICE CULTIVATION IN TERRACES

of bark or of cotton cloth spun by the women, or obtained in trade with the Ilocanos. To this is sometimes added a light blanket, worn when it is cold, as in the late afternoon or the early morning. The Bontoks wear a small hat of basketwork, which is used more as a pocket than as a protection for the head. The Igorots wear a headband for the same purpose. The women wear a skirt, a girdle, and a waist, usually of cotton. Blankets are used by the women as well as by the men.



AN IGOROT HOUSE

The agriculture of the mountain peoples is such that there is no necessity for changing residence. Their houses are therefore much more comfortably and permanently constructed than those of the Subanuns. They are of two types: one built high above the ground, on large pine timbers; the other resting on the earth. The sides are of overlapping pine boards or of mud and stone. The steep-sloped roof is made of grass.

The mountain peoples manufacture numerous articles. They make stone into hammers, and into troughs and bowls for pigs. They make the crude agricultural implements. They

fashion wooden pails for the food of pigs, wooden dishes, bowls, dippers, and spoons for the household, and wooden shields and spears. They often carve tobacco pipes out of wood. This work is done laboriously with knives and fire, and the articles are frequently ornamented with the figures of people or of animals. The making of articles from metal is confined to a few persons, for the reason that this requires considerable skill and experience. In the smithies are produced



PRIMITIVE POTTERY MAKING

several styles of spear blades, battle-axes, and bolos. Two or three men work together. One operates the bellows, another feeds the fire and does the heavy striking during the initial part of the work, and the third, the blade maker, directs the labor and performs the finer parts of the production. The iron used is scrap, obtained from the lowlands. The metal is hammered with a large stone hammer on a stone anvil, and is tempered in water. Nearly all Igorot towns make the clay and wooden pipes locally used for smoking tobacco. A few men, however, gain a living by traveling from one town to

another making pipes of brass. These men fashion a model of the pipe bowl in beeswax embedded in a jacket of clay. When the clay is baked, the wax melts and is drawn off, leaving a clay mold. Into this the molten brass is poured. Brass pipes are usually fitted with a stem of similar metal. Where suitable clay is found, pottery making is also carried on, and, as with the Subanuns, the work is left to the women. The bowls, formed with the hand and a stick, are sun-baked, then fired, and afterwards glazed with resin. Baskets, on the other hand,



PRIMITIVE WEAVING

are made by the men. These are produced in numerous forms, some for storing food, some for winnowing, some for holding rice. One of the most important kinds of baskets is that used by the men for transportation.

A small amount of sugar cane is grown. This is crushed in crude mills, and the juice is crystallized in large iron boilers. It is often fermented in tightly covered jars. The drink thus made is known as basi. Tapui, or bubud, a rice beer, is made and drunk extensively. Several salt springs

are to be found in this mountainous region. The salt from the water of these springs is allowed to accumulate on stones. The salt is then washed from the stones, and the resulting brine is evaporated.

The Igorots obtain whetstones, flint, and clay for pottery, and to a small extent mine copper and gold. From the forests they cut lumber for their houses, the logs being reduced to boards by means of axes.

It is interesting to note that in the raising of crops and the transformation of materials the work is divided. The older children gather food for the pigs and guard the rice terraces. The men cut the wood and lumber, build houses and dikes, construct irrigation dams, and transport the harvested rice. They manufacture and sell basi. They produce implements and utensils for the house. They weave baskets, and work with stone and metals. The women are the spinners and the weavers (for some cloth is made by these people). They also prepare the seed beds and set out the rice plants in the terraces. They plant, cultivate, and harvest sweet potatoes, millet, corn, and beans, and assist the men in transporting soil. Some are makers of pottery and of salt. Both men and women thresh rice, carry water, and make the rice drink. The old people are the counselors, and do the light work. They guard the crops, attend the children, carry water, and cook the food.

DIVISION OF LABOR BETWEEN SEXES IN IFUGAO¹

MEN	WOMEN	BOTH
Spading fields	Planting rice	Cooking
Getting wood	Tending rice	Harvesting
All work in wood	Weaving	Care of baby
Pot burning	Pot molding	Carrying rice to granary
Blacksmithing	Gardening	Camote culture
Rice-field construction		
Basket making		

¹ By Roy F. Barton.

Often a larger number of persons than are included in the family are needed to do a piece of work. In housebuilding, and in much of the agricultural work, such as constructing a system of irrigation, several families group their labor. The mountain peoples do not employ animals in tilling the soil, nor do they often employ them in transportation. Goods are carried on the backs of men and women.

Some of the articles manufactured by the mountain peoples are not produced in all communities. Thus, in Bontok, pottery is made by women of Samoki; salt comes from Mainit; battle-axes and spears from Baliwang and Balbalasan; clay tobacco pipes are made in Agawa; whetstones are the product of Basao. These articles are disposed of by men from the producing towns, who, traveling in groups, take their wares on their backs to other towns for trade. The system is one of barter; that is, the men exchange their products for others obtainable in the different localities. Yet in all these transactions there seems to be a growing preference for the use of certain objects as a medium of trade. Particularly is this true of *manojos* (bundles capable of being grasped in the hand) of rice in head. The Igorots often pay for articles with these bundles. If they barter one article for another, they often estimate the values of these in terms of *manojos* of rice. To a less extent pottery, tobacco, and salt are used in exchange. More and more also the Igorots are employing silver and copper coins and even paper bills, but these are the result of a civilization higher than theirs.

In comparing the Subanuns with the mountain peoples, as we have below, we readily see points in which the latter have surpassed the former, and other points in which the two are on the same plane.

1. Though the implements of agriculture¹ which the Igorots and Bontoks employ are the same as those of the Subanuns, the former have, through irrigation, succeeded in preventing

¹ The spades used by the Ifugaos are superior to the pointed stick.

the hardening of the soil and in keeping out weeds. By the use of fertilizers they have prevented exhaustion of the soil. Thus, being able to use the same piece of land constantly, they have achieved permanency of residence.

2. The mountain peoples have greater variety of food than the Subanuns.

3. The mountain peoples have as great a store of food as the Subanuns, and are consequently as far removed from danger of starvation.

4. In weaving and pottery the mountain peoples are no farther advanced than the Subanuns, but in woodwork and metal work they have surpassed them. In metal work they have gained division of labor, since various operations in the process of making articles of metal are carried on by different workmen.

5. The number of products used by the mountain peoples for ostentation are at least as numerous as those of the Subanuns, and many, such as the carved bowls and tobacco pipes, are of local origin and design.

6. The Subanuns have but the beginnings of commerce; for their trade consists only of that with a higher race. The Igorots, Bontoks, and Ifugaos, on the contrary, have developed a system of exchange among themselves which is more important than the commerce carried on with outsiders. This exchange results from a diversity of production in the different communities.

7. Finally, the mountain peoples have acquired a very definite idea of the value of their products. They are not cheated, as are the more simple Subanuns.

The life of the mountain peoples may be briefly described as one in which an excellent, though still primitive system of agriculture provides an abundance of food and a surplus against the exigencies of a poor crop, and allows permanent residence and the utilization of the labor of a few men in the manufacture of useful articles and luxuries.

GENERAL COMPARISON ¹

Buecher, in his "Industrial Evolution," has aptly stated that human needs are capable of an infinite multiplication and subdivision; they are never at rest; they increase in degree and extent with the progress of civilization. Thus we have seen that the needs of the Negritos are little more than food, and of this barely enough to keep life in the body. After a people obtains a supply of food above its actual immediate needs, its wants become more diversified; it begins to improve its methods of production, to increase the variety of its diet, to make better shelter and clothing, and to develop taste for art and for display. In short, its wealth increases not only in amount but in kind.²

¹ In the consideration of these three groups of peoples the subjects touched on have been the products they use for food, clothing, shelter, and amusement, how these products are obtained and exchanged, and in what manner they are divided among the people; that is, the discussion has been about those things which minister to the physical needs of man and help him to live. Anything which helps man to live is called wealth.

² Certain forms of wealth which the Subanuns possess would not be considered wealth by the Negritos. For instance, the Chinese jars, which are with the Subanuns the most prized of all possessions, would not be valued by the Negritos. In the same way the irrigation systems and the fertilizers employed by the Igorots would be useless to the Subanuns, who consequently would not consider them wealth. Likewise a plow or the services of a tailor would not be considered wealth by an Ifugao. Thus it can be seen that objects or services which may be classed as wealth by one group of individuals may not be considered wealth by another.

We should observe another peculiarity concerning those things which help man to live. "Some things are said to be valuable, as in the case of a gold watch or diamond ring, because in exchange for them we can get a great quantity of other articles. Ashes are of little or no value because we cannot get anything in exchange for them. Now this word 'value' is a very difficult one and is employed to mean different things. We may say that quinine is valuable for curing fevers, that iron is valuable for the blood, or that water is valuable for putting out fires. Here we do not mean valuable in exchange, for quinine would cure fevers just as well if it cost a penny an ounce instead of some ten shillings. Water, if we can get it at the right time, puts out a fire whether it costs much or little or nothing" ("Political Economy," by W. Stanley Jevons). It is clear, then, that by value we may mean *value in exchange* or *value in use*, or both, and a thing which may have little value in exchange may have great value in use. Thus the value of air is the utility

Not only does man come to possess a greater amount and variety of wealth as he becomes more civilized,¹ but he is less and less dependent on nature, and more and more dependent on his fellow man. The lowest form of human being that can be imagined is one whose only activity is the procuring of food, and who wanders about alone, living on worms, slugs, roots, twigs, and such nourishment as he can obtain without the assistance of any kind of implement. Such a human being is not known to exist. All men so far encountered live in groups, understand fire, and possess certain implements which assist them in obtaining their living. The search for the necessities of life and the desire to obtain them with the least effort have caused such groups to evolve systems by which these necessities (wealth) are produced, exchanged, distributed, and consumed. The more complicated the system, the greater the wealth, and the greater the surplus over the bare necessities of existence.

Greater complication of the economic system with advance in civilization is well illustrated in the tribes under discussion.

Of the most lowly of known human beings the Negritos are a good example; but even among these people we see the beginnings of a system. There is a division of labor between the sexes; in general, the men do the hunting, and the women gather or grow the vegetable foods. There is also some idea of division of wealth among them, as shown in the distribution of the carcass of an animal killed in the chase.

of the air we breathe; the value of water is the utility of the water we drink or use in washing or cooking; but, although this utility is great, neither air nor water can be exchanged for other articles. Hence the definition of wealth previously given must, from an economic standpoint, be qualified to exclude those things which have no value in exchange. *Wealth consists of those things which help man to live, and which have value in exchange.* Economics is the study of wealth.

¹ The term "civilization" is complex. It is usually interpreted to include government, literature, art, and morals, as well as food, clothing, shelter, amusements, and the like. Within the scope of this book, however, the term refers only to the material or economic advance.

The Negritos are in the *stage of primitive group economy*,¹ in which production is solely for the group's needs, and in which goods are consumed where they are produced. On the other hand, the Subanuns are on the verge of, and the Bontok Igorots and Ifugaos are just entering, the *stage of primitive town economy*, the stage of direct exchange, where goods pass directly from the producer to the consumer. The Subanuns are much more independent of nature than are the Negritos, since they have a surplus supply of food. The mountain peoples are still more independent on account of their irrigation system and their use of fertilizers. But their system of producing wealth, and of exchanging and distributing it, is, as a result, more complicated. There is greater division of labor between the sexes; artisans such as the blacksmith and the pipe maker have emerged to spend their entire time in producing one kind of article.

Thus we see an advance from a system in which the individual obtains his own food to a system in which certain persons do not produce food, but are dependent on others for their sustenance. They transform raw material into finished products and exchange them for food, clothing, and other necessities. We see, also, an advance from a condition in which men wander from place to place to a condition in which they form towns. A more advanced stage is that in which each town produces certain articles. Such a division in the production of articles brings into existence the idea of exchange, first between individuals and then between localities (towns). This exchange calls for men to take the goods from the producer to the consumer. From these men arises the need of a standard commodity which is acceptable in exchange for products, and by which relative values of articles may be measured. This standard commodity is money. Among the mountain peoples we have seen that bundles of rice are most often used as money. As civilization spreads, we observe

¹ The stages of economic development noted in this book are suggested by Buecher's chapter on "The Rise of National Economy."

changes in the distribution of wealth. Among the most primitive peoples there is little difference in the amount of wealth possessed by individuals. This condition results from the simplicity of the method by which wealth is obtained, and from the small amount of wealth which exists. Among the mountain peoples, however, there are men who possess a large share of the surplus productive wealth of the community, such as rice terraces, pigs, and carabaos. Men who have none of these must work for the owners, or starve, or revert to more primitive conditions of living. Hence, to a large degree, these workers are economically dependent on the possessors of productive wealth.

THE FILIPINOS

Among the semicivilized of the Philippines the mountain peoples have made the greatest economic advance. From them we may pass to the Filipinos.

The system by which the Filipinos' wealth is produced, exchanged, distributed, and used shows they have reached the stage of *national economy*, the stage of wholesale production and of the circulation of goods, where products must ordinarily pass through many hands before they reach the consumer. This stage is not so easily comprehended as are those of primitive and semicivilized tribes. It is not grasped in an idea, nor explained in a few words. It is a stage of civilization in which the actions of men are governed by many economic laws, many ideas, and many customs not found among primitive peoples.

SUGGESTIONS FOR REVIEW AND ORIGINAL WORK

SUGGESTIONS BASED ON THE TEXT

1. Make a table of parallel columns for the Negritos, the Subanuns, and the mountain peoples, comparing them as to (a) food; (b) clothing; (c) shelter; (d) savings and other forms of wealth; (e) implements; (f) methods of agriculture; (g) manufacture; (h) commercial and industrial organization.

2. Would more-advanced peoples occupy by preference land which the Negritos now occupy? 3. What does your answer suggest as to the power and influence of the Negritos? 4. Do these people do anything to advance the welfare of the country in which they live? 5. Suggest a work of economic value which they could perform. 6. Make a general plan for the economic development of the Negritos, pointing out difficulties and the methods of overcoming them.

7. Apply to the Subanuns the tests suggested in the questions on the Negritos. 8. Under what influences have the Subanuns made their progress? 9. Would additional outside influence be of value in hastening their progress? 10. If so, how should this influence be applied? 11. Make a list of some of the forces which retard the development of a backward people and suggest remedies.

12. Apply to the mountain peoples the tests suggested in the questions on the Subanuns. 13. Do all forces which retard the progress of a backward people apply to the mountain peoples? 14. Would any of the features of your plan for the economic development of the Negritos be useless if applied to the mountain peoples?

SUGGESTIONS FOR REPORTS FROM REFERENCES

1. Give in some detail the governmental plan for the advancement of these tribes. 2. What officials are in charge? 3. How can the private citizen give aid? 4. Can you justify the taxation of the Filipinos for the benefit of these tribes? 5. Do you consider that the government or any private citizen has any right to exert influence for the purpose of changing the customs and habits of the primitive peoples? 6. Defend your answer.

7. Where, how, and why are kaingin made? 8. Their effect on standing timber and the cogon area. 9. Control by the Bureau of Forestry. 10. Reforestation and habitual kaingin makers.

SELECTION ON THE THEORY OF ECONOMICS TO BE APPLIED TO THE MATERIAL IN THE CHAPTER

1. Human needs. Wealth (Bullock, pages 10-13). 2. Stages in the production of wealth (Bullock, pages 29-31).

PART II. AGRICULTURE

CHAPTER II

RICE AS A FOOD CROP¹

IMPORTANCE AND FOOD VALUE

In nearly all parts of the Philippines the chief food is rice and fish, or corn and fish. As a general thing, the more remote a place is from the sea, the less fish is consumed; so that in many inland localities the diet is almost entirely vegetable. In ordinary times of plenty the food of both the well-to-do and the poor varies little in either quantity or kind. In times of scarcity, however, the food of the poor usually decreases both in quality and in quantity, while that of the rich is not affected.

From the point of view of food values, corn is a better-balanced ration than rice. The latter is deficient in fat, and contains less protein than any other cereal. Corn, on the other hand, is high in fat, and has a considerable percentage of protein. The amount of protein contained in the three chief food cereals is as follows:² rice, 8 per cent; corn, 10 per cent; wheat, 12.2 per cent. Rice is easily prepared, and is easily digested when properly cooked, but its deficiency in nutritive values must be made up by other foods (such as fish, beans, and meat) which contain proteids and fats. The consumption of rice alone, toward which there is a present tendency in the Philippines, results in malnutrition. It would seem, also,

¹ For description and commerce, see "Commercial Geography, the Materials of Commerce for the Philippines," by Miller, Bureau of Education, Manila, 1911; also *Bulletin 22*, Bureau of Agriculture, Manila, 1912.

² *Farmers' Bulletin 298*, United States Department of Agriculture.

that the cause of beriberi¹ is the lack of phosphorus in the diet of polished rice, a condition which can be overcome by the substitution of unpolished rice (which contains from three to five times as much phosphorus), or by the more extensive use of fish and other foods containing phosphorus.

CULTIVATION

Rice is not only the chief food used in the Philippines as a whole, but is the principal crop of these Islands. An appreciable quantity of mountain or highland rice is grown, mostly in kaingin, in the less densely populated regions. This is sown broadcast, cultivated, and reaped as are other dry-land crops. The amount of rice raised by this system, however, is small in comparison with that produced by the lowland (or flooded-field) system, by which the greater part of the rice crop of the Philippines is grown. Along most eastern coasts, and on the northeastern coasts of some islands, the rainfall is continuous throughout the year, so that there can be no definite seasons for rice culture. The inhabitants of one town may be planting while those of another town, not more than a few kilometers away, are harvesting. The central and western regions of the Philippines, however, are subject to a dry season, during which rice cannot be cultivated without extensive provision for water storage and irrigation. The amount of water so stored, or of water which can be diverted from rivers during the dry season, is almost negligible. Since the chief rice districts are in regions affected by the dry season, it holds generally for the Philippines that but one crop of rice is raised annually. This is planted and cultivated during the rainy season (from June through November) and harvested at the beginning of the dry season (December or January).

The rice lands in the Philippines are divided into small fields in which dikes* serve to keep the water. When the soil

¹ A prevalent Oriental disease characterized by an anæmic condition of the body.

has become softened, it is plowed and harrowed. The plow used is a small one-handled affair of wood, sometimes shod with iron, which merely digs and does not leave much of a furrow. The harrow is usually made of bamboo, with iron or wooden pegs driven through and fastened. In many places



NEWLY PLANTED LOWLAND RICE FIELDS

is customary, further, to reduce the soil to a slush by driving carabaos over it or by working it up with the feet. The seed is sown thick in beds, which are usually near the house of the farmer. When the young plants are a foot high or more, the women pull them and transplant them into the fields. If the rains are sufficient to drown the weeds, the farmers may rest until harvest time; but if the weather is so dry that the water does not stand in the fields, it is necessary to cut out the weeds.

HARVEST, SALE, AND CONSUMPTION

One of the most expensive operations in the production of rice is the harvesting, which is done by hand. The heads are cut with short stalks, which are tied together in bundles about the size of the fist. In those regions of the Philippines where there are many small holdings, the farmers are wont to make communal labor of planting and harvesting. In many districts where land is in large holdings, it is customary to harvest on shares for an amount varying from one tenth to one third of the crop, the usual amount being one fifth. During the latter part of a bountiful harvest even half the crop may be given to reapers as an inducement to keep them at work. In certain places there is a tendency to substitute daily wages for this system, particularly when a poor harvest occurs and the price of rice is high. In other places the two systems are combined, as, for instance, in Nueva Ecija, where wages varying from ₱0.15 to ₱0.20 are paid, with the privilege of carrying away as much rice as can be put in a basket. Thus a family of three may work six days and get ₱2.70 in cash, and four or five cavans of rice valued at ₱10 or more. As a substitute, daily wages of only ₱0.40 are paid.¹ This system of harvesting on shares is decried by those who have made a study of the situation from the commercial point of view. In the first place, it results in an exorbitant cost of the production of rice. In the second place, a family working a month can obtain enough rice to support them for six months, during which they need do no labor. This is conducive to laziness and vice. In well-populated sections of the Philippines there is, during the harvest season, an exodus to rice regions, sometimes a considerable distance away. Often whole families leave their homes. On returning they usually bring with them their share of the crop.

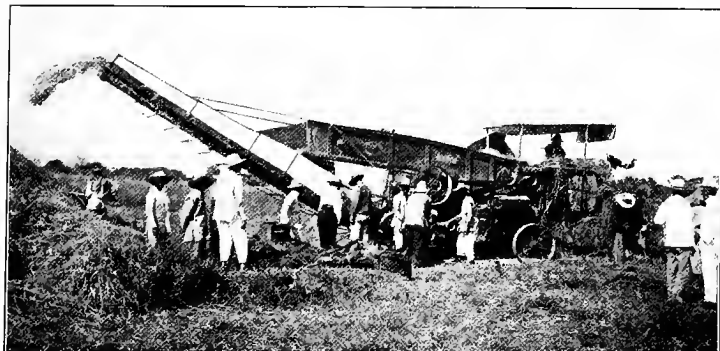
¹ From the economic report of Cenon S. Monasterial, made in 1912. Wages and prices have risen since then.



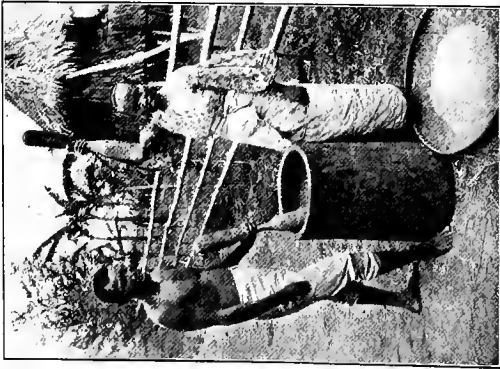
POUNDING THE HEADS ON A LOG



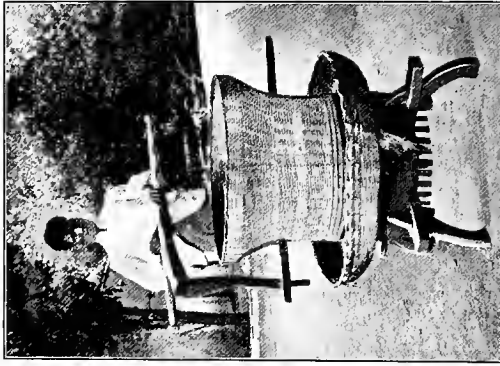
TREADING OUT THE GRAIN



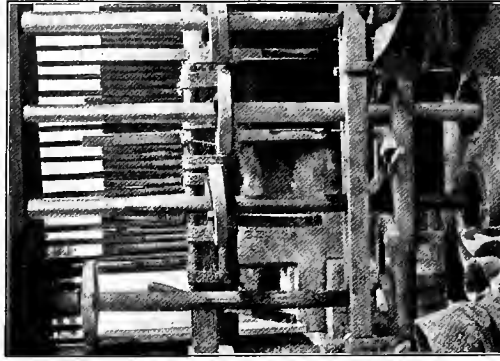
A STEAM THRESHER
METHODS OF THRESHING RICE



DIRECT HUMAN POWER



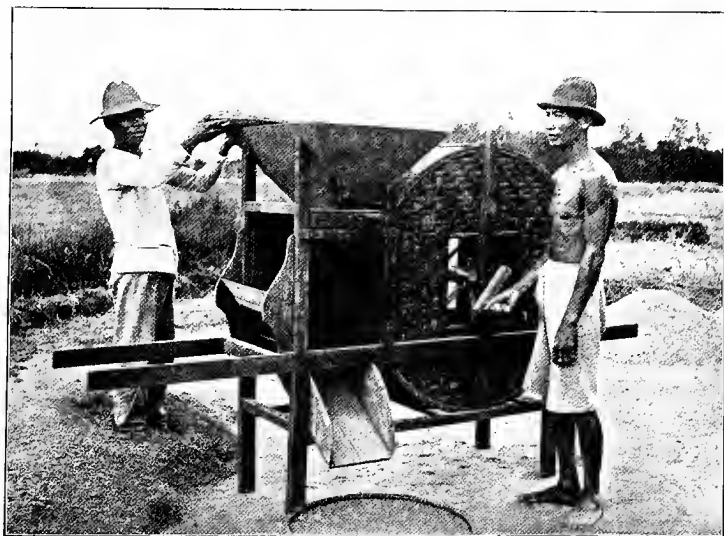
INDIRECT HUMAN POWER
METHODS OF CLEANING RICE



WATER POWER



WINNOWING WITH THE WIND



A WINNOWING MACHINE
WINNOWING RICE

At a glance it would seem that this state of affairs might be changed by machinery, but thus far the mechanical harvester has not been successful in the Philippines. The crop is always cut by hand, and in nearly all districts the rice is threshed by pounding or tramping it, although in the large rice-growing regions steam threshers are coming into use. These machines are generally owned by companies which charge one tenth of the amount threshed. The companies are usually composed of local landowners, who thus divide the initial cost of the threshers among themselves, and by this coöperation gain the use of machinery which no one of them could afford to purchase by himself.

The removal of the hull and bran is the final step in the preparation of rice for cooking. If rice is to be used locally, this process is nearly always done by hand, in a wooden mortar and with a wooden pestle, or in a crude rice mill made of mud and bamboo. In exporting regions, such as the Central Plain of Luzon, rice mills have been introduced in large numbers, the product being sent away in the form of polished rice. Except in large cities it is customary for the Filipinos to store rice in the husk, since it is supposed to keep better in this way. It is hulled as needed. Where mills exist, however, householders often take their rice to the factory one sack at a time. The charges for milling rice are usually from twenty-five to forty centavos for a cavan of palay.¹ The mill owners seldom do milling on shares. The larger mills buy palay just after the harvest season, but do not mill it until private milling is at an end. Thus the machinery is kept going the whole year, and a good profit is made on the rise in the value of the palay.

In certain districts of the Islands, from northern Luzon to Mindanao, a peculiar phenomenon is connected with the sale of rice by owners of small amounts of land. Immediately after the harvest the price of rice is low, but with almost

¹ From data at the Bureau of Agriculture.

RICE MILLS

[Source: Bureau of Agriculture]

PROVINCE	NUMBER OF RICE MILLS									TOTAL MAXIMUM DAILY CAPACITY	
	Steam	Petroleum	Hand power	Water	Hydraulic	Gasoline	Oil	Animal power	Unclassified		Total
Albay		1		14			2		5	22	<i>Cavans</i> 947
Antique			1							1	2
Bataan	5									5	820
Batangas	22	25				4				51	5,531
Bohol			1							1	16
Bulacan	40									40	9,066
Capiz	4		23							27	990
Cavite	14	1					1			16	3,059
Cotabato	1									1	150
Ilocos Norte	1									1	120
Iloilo	3		22							25	1,794
Laguna	22	20		12	11	5			2	72	5,330
Lanao		3								3	108
Leyte			6							6	55
Mindoro		1				1				2	160
Negros Occidental	4	5								9	450
Nueva Ecija	7	2								9	3,880
Pangasinan	5									5	1,525
Sorsogon			2	2						4	56
Tarlac	6	1								7	1,090
Tayabas	3	8		12	3	2		2	2	32	796
Zambales		3							1	4	244
Total	137	70	55	40	14	12	3	2	10	343	36,189

NOTE. The total daily capacity shown above does not represent the actual output of the mills, but their potential maximum capacity. The mills of Manila are not included. (The Statistical Bulletin No. 1, Bureau of Commerce and Industry.)

This table indicates the provinces which are important in the production of rice for commerce. The table of Rice Production and Consumption on page 59 indicates, however, that several of the provinces which have facilities for milling large quantities of palay do not export rice; in such provinces as Batangas and Laguna the product of the mills is consumed locally.

inconceivable shortsightedness the small farmers sell practically their whole crop to the merchants who control the trade. Soon the small amount of rice which they have retained is exhausted, and they begin to buy back at a constantly advancing price what they have sold, so that before the next harvest they are obliged to pay from one hundred to two hundred per cent profit to the merchants. These small farmers often squander their money as soon as they have obtained it; this causes a considerable amount of misery. Sometimes they are so improvident, or so hard pressed, that they sell their crop in advance, at about half its nominal value.

RICE IMPORTS

The amount of rice raised in the Philippines has been insufficient to supply local consumption by about twenty per cent. It was estimated by the Bureau of Agriculture that the local production in 1910 was about 530,000 metric tons of cleaned rice. In the same year 185,000 metric tons of rice were imported,¹ the value being about twelve per cent of the total imports.

In the middle of the nineteenth century the Philippines were already importing a little rice. In the year 1877 about 23,000 metric tons were imported, being 5.78 per cent of the total value of imports. Since then there has been a fluctuating but increased import. In the year 1903 about 334,000 metric tons of rice, valued at more than ₱25,000,000, and representing about thirty-seven per cent of the total imports, were brought into the Philippines. This is the largest annual import of rice in the history of the Islands. The lowest annual import in recent times was in 1913, when about 87,000 tons were brought in, valued at about ₱6,300,000. This value

¹ The year 1910 may be taken as a usual one. If we allow an average consumption of one and a half chupas of rice a day for 6,500,000 inhabitants (that is, the population of the Philippines less the population of corn regions), we obtain a total yearly consumption of 715,000 metric tons, a verification of the accuracy of the figures above.

represented about six per cent of the total value of all the importations into the Islands.

The history of rice importations into the Philippines and of the price of rice is graphically shown in Chart I.¹ In Figure I the light angular line shows the actual imports by years. The heavy line is a smoothed one, and shows the tendency of the rice trade over a period of years.²

The lines of Figure II represent actual prices and the tendency of prices respectively. From the smoothed line (heavy) it will be noted that the price of rice fell rapidly in the period 1877-1895; that it jumped considerably in 1899; and that since then it has been slightly on the increase. The high prices in 1912 and 1918 were the result of a general shortage in rice.

From the smoothed line in Figure I it will be seen that imports of rice gradually increased during the later years of Spanish occupation, but were dropping sharply at the end of the nineteenth century. Perhaps they would have ceased, had not a new commercial policy been established, the policy of encouraging foreign trade.

The high level of rice imports after 1900 (represented by the heavy line) was brought about by this change and by disturbances of one kind or another.

Let us now study the particulars of our rice trade. Turning to the fine line, which shows actual imports, we see that rice imports have fluctuated greatly, there being six periods of extraordinary importation between the years 1877 and 1918. Either of two conditions may have caused these extraordinary importations, namely, the price of rice in Saigon, or shortage in the local crop. If we compare the line of actual imports with that of actual price, we shall see that they bear no constant relation. Imports of rice do not tend to increase as price decreases, nor vice versa. It is probable that the world price

¹ No reliable customs statistics are available for the years 1896-1898 inclusive.

² The position of the smoothed line is obtained by averaging the figures of rice imports by fives. The averages so obtained are noted by crosses.

of rice is not much affected by the importations of rice into the Philippines; it is also true that the Islands do not import larger quantities of rice when the price in Saigon is low.

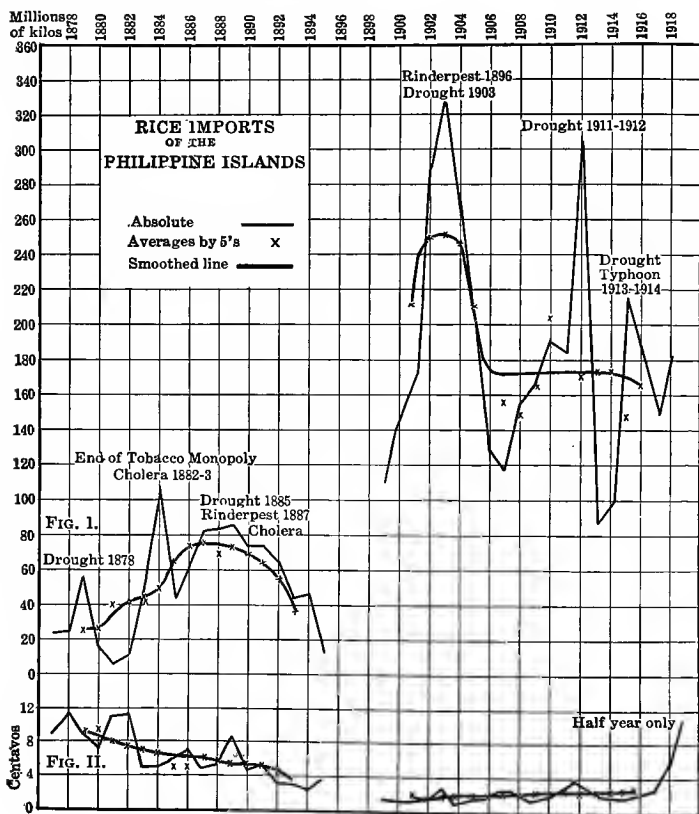


CHART I. PHILIPPINE RICE IMPORTS

Census and Customs Statistics

Extraordinary importations of rice would therefore seem to be the result of decrease in the local crop; history bears out such a conclusion. The unusual importation of 1879 was the

result of the drought of the season of 1878-1879. The large import of the year 1883-1884 was caused by the end of the tobacco monopoly in 1881 (and the consequent increased planting of tobacco at the expense of rice cultivation) and by the cholera of 1882-1883. The large increase in rice imports in the years 1886-1889 was due to the drought of 1885, to the epizootia (similar to or identical with rinderpest), which began in 1887, and to cholera in 1888-1889. The increased imports of 1901-1905 were occasioned by the rinderpest and the drought of 1903. The drought of 1911-1912 again caused a very heavy importation of rice. The local crop of rice and corn in 1912-1913 was very large in consequence of increased planting and favorable weather conditions. Hence the importation of rice in 1913 and 1914 fell far below the average. Drought and typhoon in the season of 1913-1914 caused the latest extraordinary increase in the importation of rice.

Extraordinary importations of rice are the result of temporary conditions. The heavy line in Figure I shows that since 1900 the general level of the greatly increased importations of rice has been maintained, and that apparently this level is still continuing. The causes which have brought about large importations of rice are permanent, and may be discussed under four headings:

1. First should be mentioned the lack of work animals. In Japan and regions of Java a carabao in a rice field is an unusual sight, all preparation of the soil being regularly made by hand labor. In the Philippines, however, it is considered essential to plow with a carabao, and hence, because of the scarcity of animals due to rinderpest, much of the rice land has been allowed to remain idle.

2. Actual failure to cultivate rice lands often occurs even where animals are obtainable. The method of rice culture in the Philippines is such that it involves greater effort, disagreeableness, and monotony than most other work; and the status given the field laborer is the lowest. As a result, there is a tendency to take up more agreeable work or to labor as

little as possible in the rice fields. This condition has left many small holdings uncultivated, and many large owners without labor. The failure to cultivate rice lands can often be laid at the door of the large owners also, who have preferred to live in town rather than spend their time in the country superintending their farms.

3. Failure to obtain a full crop also results in importation. This may be due to several causes: (a) when there is no irrigation, crops often suffer from lack of water, so that a

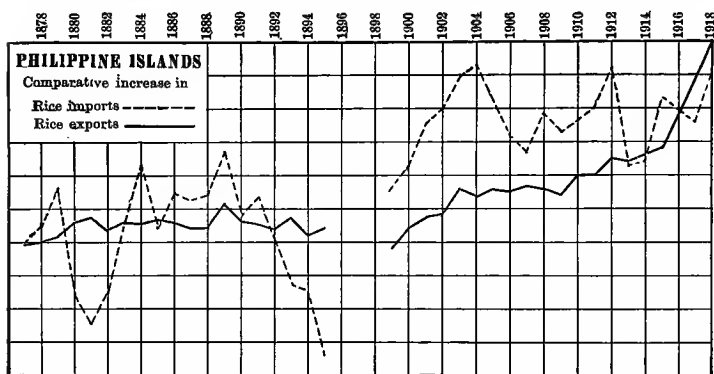


CHART 11, A

complete or partial failure of the crop occurs in many localities every year, and in exceptional seasons (as in 1911–1912) throughout the Philippines; (b) preparation and cultivation of the soil are usually poorly done, this being due, for the most part, to lack of suitable agricultural implements; (c) pests, such as worms and field rats, do no small amount of damage to the rice crop, and in exceptional years locusts destroy much of the growing and standing crop; (d) much of the possible crop of rice is lost because the seed is not selected.

4. Another important reason for the diminished cultivation of rice in the Philippines is the production of export crops, such

as copra, abaca, tobacco, and sugar. These crops do not require so much work, and it is of a more agreeable character. The high price received for such exports, and the use of less and more easily obtained labor in their production, have encouraged landowners to devote their holdings to these products rather than to the production of food. Indeed, it would seem that the net returns from raising export crops and importing food are frequently greater than the returns from producing the food itself, not only to the landlords, but to the laborers and to the Islands.

Chart II, *A*, shows the relative increase of rice imports into the Philippines and the total exports from the Philippines since

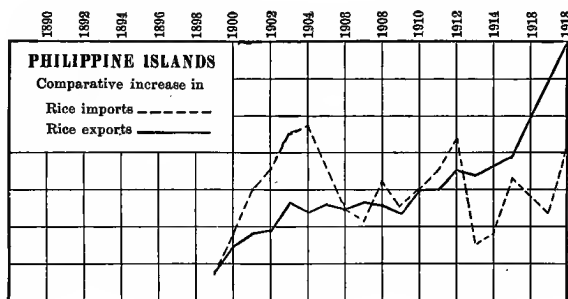


CHART II, *B*

1877.¹ It will be seen that until 1895 rice imports, although they fluctuated greatly, increased in about the same proportion as the total exports. In 1899, however, rice imports increased in greater proportion than did the total exports, and up to 1913 kept this relative position (which is probably due to the scarcity of animals and the noncultivation of rice fields). However, if we compare the years 1899–1912 (by bringing them together at 1899 in Chart II, *B*), we shall see that in this period also rice imports and the total exports tended to increase in the same proportion, the upward movement during the first

¹ This chart is drawn on a logarithmic scale, which shows no definite amounts, but (practically) percentages of increase and decrease.

few years being caused by famine, pest, and drought. Hence, from customs statistics it is learned that the general increase in imports of rice was due to a proportional increase in exports, and that the extraordinary high level in the importations of rice in the period 1899-1912, over the period 1877-1895, resulted from the scarcity of animals for cultivating rice fields. With the year 1913 a change appeared. General exports continued to increase in volume, but a lower level in the importations of rice seemed to have been reached. Evidently other factors than export crops influenced the situation in rice after 1913.

INCREASE IN DOMESTIC PRODUCTION

The only economic consideration which would warrant the importation of rice by the Philippines is found under the fourth heading (page 38), the raising of such crops as furnish products which can be exported and exchanged for more rice than could be grown locally. But such a procedure, when carried to the extreme, results in a dangerous situation, since it makes the Philippines dependent on foreign supplies for food. It is an axiom of good government that a country should produce as much of its own food as possible, and keep on hand a supply as a protection against short crops or unfavorable conditions in the world at large. This subject cannot be treated here at length, since it properly comes under a more general heading (see Chapter XI), but it will be readily seen that if the crop in southeastern Asia (the rice-exporting region of the world) should be seriously curtailed by unfavorable climatic conditions, political upheaval, or the like, the consequences would be disastrous to the Philippines. Such a condition was approached in the season of 1911-1912, when there was a partial failure of the rice crop. During the World War the demands in Europe for Saigon rice, and the lack of transportation to the Philippines, produced a situation fraught with danger to the Islands. A consideration of the methods by which production of rice.

in the Philippines may be increased is therefore extremely important. Let us proceed to examine these methods:

1. An increase in the number of work animals (carabaos and cattle) will bring into cultivation much of the rice land now lying idle. In several districts of the Philippines there have been large importations of draft animals from Asia, and a correspondingly increased area devoted to rice production; but on account of rinderpest and other diseases existing in Asia this importation is extremely dangerous. Several outbreaks of rinderpest and other diseases have been directly traced to infection introduced in this manner. Hence the importation of foreign cattle and carabaos has been carefully guarded, and the government has undertaken a campaign of quarantine and close supervision of the draft animals coming into the Philippines, with the hope that by this means rinderpest will be held in control and no further infection from outside will be allowed to complicate the domestic situation. The average number of carabaos imported annually is about 1500, and the average number of cattle about 10,000. Most of the latter are killed for meat. From 1903 to 1917 the number of carabaos in the Islands had increased from 640,000 to more than 1,200,000, and the number of cattle from 130,000 to more than 500,000. This indicates that the attempt to guard the natural increase of work animals and of the imported animals has been successful.

An indirect accession to the work animals available for rice fields is the result of the expansion of motor transportation, and the introduction of small farm tractors on dry cultures. Heavy machinery cannot be used on the soft rice paddies, but the use of tractors on sugar and other dry lands liberates a considerable number of animals for the cultivation of rice. The substitution of the motor truck for the carabao and bull cart is also a help.

2. A further increase in the yield of rice would be possible if the profit could be increased by a reduction in the cost of the production.

The fall in rice imports in 1913 was chiefly due to the large domestic crop of 1912-1913. This increase in the domestic crop resulted from the high prices of that period, and is a measure of the effect of good profits. The large areas planted with rice in 1917 and 1918 were the results of high prices for rice during war times. Indeed, from Chart III it is evident that there is a close connection between the price of rice and the production. Naturally, when the price is high and profits are good, a larger area is planted and more care is taken than when the price is normal and there is little margin of profit.

But cannot greater profits be made from rice culture without abnormally increasing the price of rice? Cannot the cost of production be lowered?

a. The largest reduction can probably be made in the harvesting. The share system, by which the harvesters receive as much as half the crop, and the resultant ill effect on the workers, has been explained. By the substitution of a wage system these evil effects would be done away with, and greater profit would accrue to the grower. It is probable that further reduction in the cost of harvesting could be made by the use of improved implements. It is possible that better hand implements than the present short knives can be devised. In the United States the cradle is used to advantage. This cuts quickly, and leaves the grain in a condition to cure rapidly and evenly, and to be easily handled; but it takes a considerable amount of strength to use the cradle.¹ Harvesters intended for the temperate regions have not been successful in the Philippines. For instance, some machines imported from America were found impracticable because they were geared to work at the rate of two and a fourth miles an hour (which is the rate at which horses can pull the machine), and would not operate when going at a rate of one and a fourth miles an hour (which is the speed of a carabao). Combined harvesters would also be unsatisfactory, on account of

¹ The *Louisiana Planter* (August 6, 1910), p. 87.

the smallness of the field and the tendency of heavy machines to become stuck in the mud. If machinery is to be used in the Philippines, the kind must be determined by experience in the local needs.

b. If small producers would discontinue their practice of selling nearly all their rice at the harvest, only to buy it back later at a much higher price, much loss would be avoided.



Photo by Bureau of Agriculture

HARVESTING RICE BY HAND IN THE PHILIPPINES

3. Even with the present number of animals and the present area of cultivated land, the amount of rice produced in the Philippines can be greatly increased by better methods of cultivation.

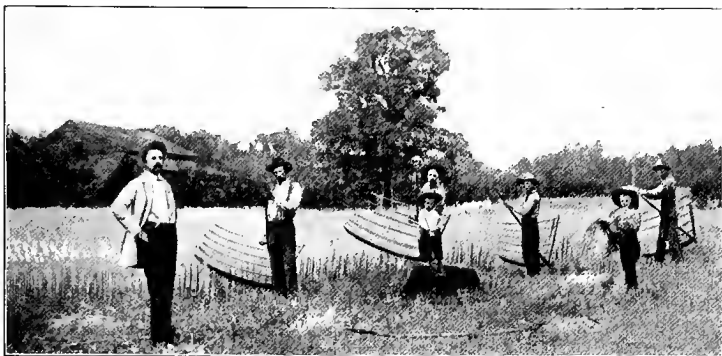
a. For the inefficient plow and harrow now used there can be substituted plows, harrows, and other implements which are much more effective in digging into the soil, turning it over, and pulverizing it. It must not be thought, however, that the agricultural machinery used in other countries can be used equally well in the Philippines. Such machinery is an outgrowth of need and experience. Nearly all of it originated in America, where the problem has been to cultivate large fields with little labor, and where horses are used. The problem in the Philippines is to obtain machinery suitable for land soaked with water, machinery which can be drawn by

carabaos or cattle, and which will be effective in small fields where the furrows are short and the animals have to turn many times.¹ Plows adapted to American fields cannot be used in the Philippines because they do not meet these conditions. Drills for planting the seed have not been successful because they are not intended to work in soil so poorly plowed as the Philippine fields. On the other hand, plows which have been especially designed for Philippine use have succeeded in a number of districts. The matter of agricultural implements can therefore best be met in the Philippines either by adapting the implements and machinery of other countries to the local requirements, or by devising something new. The opportunity is large.

b. Another important consideration is that of selecting seed. There are many hundred varieties of rice in the Philippines, most of which are of the lowland. Some of these yield twice as much as others. In most communities farmers have come to recognize the kinds which give best results in their particular soil, but in many localities there is still but little attention given to the selection of the variety to be planted. It has been estimated by the Bureau of Agriculture that out of 1242 well-known varieties but fifty are capable of a yield and quality commercially profitable. While there is often selection in the variety of rice raised, in but few instances is there any selection of the seed. Even if seed be put aside for the next planting, there is no attempt to pick out the best heads. Farmers usually take what palay is left over in their homes,

¹ The difficulty of the short furrow results from the building of dikes with straight sides. This may possibly be overcome by making rounded dikes, over which the machine can be dragged. Plows, harrows, and drills can be pulled by carabaos or cattle; binders and such machinery, which only work satisfactorily at a good rate of speed, may be propelled by gasoline. All heavy machinery, however, can only be used on firm ground.

Most rice soils in the Philippines are such that during the planting or harvesting they are too soft to sustain machinery. The improved plow is thus far the only agricultural implement which has been successfully adapted to small farming in the Philippines. The single-handle steel-beam breaking plow is a success.



CRADLING A FIELD OF WHEAT

Courtesy of Keller and Bishop



HARVESTERS IN MANITOBA, CANADA

From Brigham's "Commercial Geography"



WHEAT BUNDLED BY HARVESTING MACHINES AND PILED IN SHOCKS

From Brigham's "Commercial Geography"

METHODS OF HARVESTING

or they buy seed of any character. By the cultivation of the best varieties, and the careful selection of seed from these, the yield of rice in the Philippines could be increased several fold.

c. Perhaps the most important factor in increasing the yield of rice is efficient irrigation. Without consideration of the additional crops that could be raised by irrigation, which would at least double the total yield from the land under cultivation, the benefit to be derived from a constant supply of water demands consideration. The prime need of rice during its growth is water. Conditions in the Philippines are such that at the present time commercial (artificial) manures cannot be profitably applied to rice lands; but a constant supply of water assures a good crop on almost any type of soil which has an underlying impervious layer of clay.¹ Rice lands are usually dependent on the rains, and much rice is lost here and there throughout the Archipelago in all years; during seasons of widespread drought, such as occurred in 1911-1912, there is a general failure of the crop. These losses could be stopped by storage and irrigation. The methods by which the water may be obtained and distributed on the land will be taken up under a more general heading, but the question of organization for the construction of irrigation systems may receive a word of attention here. In certain regions local capitalists have built irrigation systems on a small scale. In a few districts such systems have been constructed by coöperation; that is, the fields which receive water belong to those who have built the system. Here and there are found rather extensive irrigation works, built years ago by the owners of large estates, particularly on the friar lands. Their efficiency has been in many cases reduced or destroyed through neglect or damage. But neither capitalistic, nor communal, nor private enterprise is able to build the irrigation works which certain regions need, and which topography warrants. Such projects must be undertaken by the government, since they require careful study for a long period of years, and the expenditure of

¹ *Bulletin 22*, Bureau of Agriculture, Manila.

large sums of money for construction and maintenance. It is estimated that there are in the Philippines 1,365,000 hectares of rice land under cultivation. Of these about 50,000 hectares are irrigated by old systems. Preliminary surveys have proved the existence of 485,000 hectares of land capable of irrigation.¹ Much of it is rice land.

How does irrigation increase the yield of rice? Its effect in overcoming drought and in allowing the planting of more than one crop annually is self-evident. A less evident effect is that from the control of water. For instance, rice should be transplanted just before the nodes form; never afterwards, because the yield is diminished. Philippine agriculturists do not thoroughly understand this, and usually transplant after the nodes are formed. However, they are often forced to delay transplanting because the rains do not fall in time to prepare the soil. If an irrigation system exists, the water can be turned on the fields when desired, and thus the time of planting can be controlled. This control is also important in the choking of weeds and the withdrawal of water when the grain is ripening.

The average annual production of rice throughout the Philippines is probably less than twenty-five cavans a hectare. The average production of rice in exceptionally favorable years, when sufficient rain falls at the required time, is from twenty-five to forty cavans a hectare. Under the present system of tillage, planting, and seed selection this difference may be said to result from irrigation.² Irrigated lands properly cultivated and planted with selected seed produce from fifty to seventy-five cavans a hectare. It may be stated, therefore, that the cultivated rice lands in the Philippines should, with irrigation, better cultivation, and seed selection, yield from three to four times the quantity of rice now produced. With an increase in the number of work animals and with a lower

¹ *Philippine Agricultural Review*, Vol. II, No. 11.

² These estimates are given after a careful review of all data available, including some eight hundred estimates from as many municipalities.

cost of production many of the rice fields which at present are lying idle would be brought under cultivation. With better means of production at least four times the present yield could be obtained. Hence it is possible for the existing fields to yield more than a sufficient quantity of rice for the needs of the Islands.

4. The changes on which this increased production depends can be brought about but slowly, and for quick returns another method of meeting the situation has presented itself. This is



RICE HARVEST IN LOUISIANA

From Brigham's "Commercial Geography"

to bring large tracts of virgin land into extensive cultivation. Such an undertaking can be carried out only by the government or by large corporations. Throughout the Orient rice is raised in small diked fields, just as in the Philippines, except that in many localities hoes, spades, and mattocks are used instead of the plow, and that in most countries careful cultivation of the soil and selection of seed are carried on, making the yield by the hectare much larger.

In the United States, however, an entirely different method is followed. Rice was introduced into the American colonies in 1790, by accident. It gradually became the product of small fields along the southeastern seacoast. Modern machinery is now used in preparing the soil, and drills are used in

planting. The crop is cut with sickles, but is threshed and cleaned by machines.

In 1884 farmers were settling the great southern prairie of Louisiana and Texas along the Gulf of Mexico. They found that rice grew well, and they began immediately to adapt large agricultural machinery, such as is used in growing wheat. Difficulties were met and overcome. On the whole, the extensive operations have been most successful, and larger areas are being given to rice every year. Large fields and more or less extensive irrigation systems are used, the water being pumped from rivers or wells. Heavy modern machinery is used in preparing the soil and in planting. From the time the rice is a few inches high until the harvest, the field is kept under water. Just before the rice is mature, the water is drawn off, so that by the time the crop is ready for harvest the ground is hard enough to bear the weight of the self-binders, which automatically cut and bundle the grain. Large threshers and mills prepare the rice for market. The product thus obtained is of high quality.¹

The northern part of the Cagayan Valley is a large plain, with soil well suited to rice. In the northeastern part of the Central Plain of Luzon there are large tracts of virgin rice land. In such regions as the Gandara Valley of Samar, and the Agusan and Cotabato valleys of Mindanao, there are thousands of hectares of new rice land. It would seem that with modern methods all these were capable of producing vast quantities of rice at a low cost. However, the question of available labor and of conditions of weather and soil must be considered. The problem of bringing laborers into these regions, of founding settlements, and of importing food and other necessities is difficult. In the "bonanza" rice region of the United States planting is done at the beginning of the rainy season, and the harvest takes place during the dry season.

¹ *The World To-day* (January, 1910), p. 99; *Farmers' Bulletin* 417, United States Department of Agriculture. The prices noted are less than the current prices for rice in the Philippines.

Frost and snow prevent the growth of weeds until the fields are again ready for planting. That is, the following conditions prevail: (1) machinery can be used on the land to prepare it for planting; (2) a variety of rice is planted which matures during the ensuing dry season; (3) irrigation is practiced, which insures the control of water on the fields during the growing season, and the withdrawal of water when the grain is ripening; (4) this control of water and the absence of unseasonable rains insure ground firm enough to support the machinery used in reaping; (5) frost and snow then prevent the growth of weeds until the next planting season.

These conditions are not applicable to the Philippines except in the western parts of the Islands, where a distinct dry season prevails. The eastern parts have no dry season. The central parts have a short but uncertain dry season.¹ In the Central Plain of Luzon a definite dry season exists, but the varieties of rice which are planted mature in less time than the duration of the rainy season; hence it would be necessary to plant early on dry soil with large machinery and reap by hand on soggy land, or to plant by hand within the rainy season and reap by heavy machinery during the dry season. Therefore it is not probable that large cultivation with machinery will succeed in the Philippines except on the limited soils which quickly become compact after a hard rain.

However, it may be possible to develop or find a variety of rice which will mature in a longer period of time than those varieties now ordinarily planted. If so, the plan would be feasible. But losses would have to be anticipated, since rains may occur during the dry season; these would lodge the grain and soften the ground, so that machinery could not be used for reaping. It might be possible, also, to develop or find a quickly maturing variety of rice which could be planted at the beginning of the dry season and reaped before the end of the season. In this case, however, unseasonable rains might

¹ See the discussion of Philippine climate in Miller and Polley's "Intermediate Geography."

again interfere; furthermore, plans would have to be perfected for cultivating the fields during the rainy season, to prevent the growth of heavy weeds, which would be expensive to remove. Irrigation would, of course, be necessary.

The feasibility of extensive wet cultivation in the Philippines is therefore very doubtful.

A more immediate and feasible way of increasing cultivated rice areas is by the settlement of virgin rice lands with colonists from the densely populated regions of the Islands. The provisions of the homestead law, the building of roads and railroads, and the improvement of water transportation, have opened up large areas of new land suitable for rice. The settlement of several rice regions, such as those of Nueva Ecija by Ilocanos, has been accomplished independently of government aid, and has brought several thousand hectares of land into cultivation. The government has undertaken the establishment of rice colonies also, by furnishing not only transportation to the new lands, but carabaos, implements, and funds. The colonists repay these advances as soon as their farms are on a paying basis. The six rice colonies of Cotabato were recruited from Cebu. They brought a thousand hectares of land into cultivation and were on a paying basis within two years after their formation. The success of these colonies augurs well for the development of the plan.

During the war there was great development in the production of tractors from the point of view of size, price, and adaptability. The tractor of to-day is run by gasoline or kerosene; by comparison with former types it is cheap, as regards original cost, maintenance, and running expenses. The development of these tractors was due to the lack of labor and of farm animals, and to the great demand for food products.

Although these comparatively light machines are too heavy to use on flooded fields, they may possibly be of value in the cultivation of upland fields and the production of upland rice. Much of the failure in the production of upland rice is due to

the poor preparation of the ground; lack of adequate cultivation before planting permits the weeds to spring up and choke out the rice. The tractor and the modern plow turn the soil much more deeply than can be done with the carabao and native plow. For the three years previous to 1919 abundant harvests of upland rice were produced on certain limited areas in the vicinity of Muñoz, Nueva Ecija, by the use of tractors with modern plows.

Commercial concerns are already interesting themselves in this new phase of rice cultivation. If the results are successful, this adaptation of the extensive method of rice cultivation may bring large areas of uncultivated land into production, and solve the rice problems in the Philippines. The practical results are, however, still problematical.

THE RICE SITUATION IN 1919

Has anything been accomplished in the past nine years toward improving the rice situation in the Philippines? The experiences of 1919 indicate progress.

The World War destroyed much food; there was a lack of food production in Europe; the armies absorbed labor power; the destruction of agricultural machinery and of animals was appalling; there was much diversion of labor from agricultural to war industries; Europe called on Asia for food. Meanwhile the people of the Orient were demanding more food for themselves; the war conditions in Europe brought great prosperity to Japan, the Philippines, and other countries, and gave the people greater purchasing power. At the same time a poor crop occurred in southwestern Asia. A world shortage of rice existed. In Japan serious rice riots occurred, because food was expensive and difficult to secure. Famines occurred in India and China.

This condition became evident in the statistics of rice importation into the Philippines. For the first six months of

1918 a normal importation of 77,642,000 kilos was recorded; for the first six months in 1919 the importation was only 42,634,000 kilos; in July of 1918 there were 26,000,000 kilos imported, and in July of 1919 only 4,000,000 kilos. At the same time prices increased from about nine to sixteen centavos a kilo; since the price of imported rice determines the price of the domestic crop, the cost of rice to the people in the Philippines doubled.

As rice increased in price, speculators hoarded it, expecting to realize tremendous profits. Moreover, a general poverty of transportation facilities left large quantities of rice in the granary regions, while the export sections of the Islands lacked sufficient for daily food. The cost of rice rose to exorbitant figures, and the people were unable to buy.

At this point the government took the matter in hand and fixed a price of ₱15 a sack. This, however, was too low, as became evident when the merchants refused to sell and withdrew their stock from the market. Then the government fixed a price of ₱16.25 for first-class rice, ₱15.75 for second-class rice, and ₱14 for third-class rice. These regulations proved only partly satisfactory; for many retailers and some wholesalers were forced out of business.

The government, therefore, began purchasing rice and sending it out to the provinces in which shortages existed. Typhoons and floods happened to occur in August and interfered with the moving of rice, especially from the Central Plain of Luzon, to such an extent that in localities like Sorsogon, Samar, Cebu, and Manila, which are dependent on imported rice, conditions of famine prevailed.

The public jumped to the conclusion that Island-wide shortage of rice existed. This was a natural conclusion if drawn from the statistics of imports alone. The government, however, after investigating, announced that there was enough rice in the Philippines to last until the next harvest, and purchased only 3,000,000 kilos of the 10,000,000 made

available in Saigon through the United States government. Do available figures indicate that the government was right? These figures have been plotted in Chart III.

Of all the factors which have influenced the rice situation since 1910, it will be noted, only imports of rice into the Philippines have remained stationary, with a tendency to decrease, while rice area, yield per hectare, total production, and consumption per capita have been increasing. These figures, even if they are not gone into carefully, indicate a healthy condition of affairs.

A more careful study indicates that the importation of rice in 1918 was due to the prosperity of the Islands. The production of rice in the Philippines was such in 1918 that the domestic crop would have been sufficient if the old standards had been maintained. The increment in the domestic rice crop would have been more than sufficient to feed the increased population of the Islands if the consumption per capita had been the same as in previous years.

The average consumption per capita for the nine years 1910-1918 was about 85 kilos; in 1918 it was about 112 kilos, an advance of 27 kilos. In other words, in 1918 the ten million people of the Philippines consumed an extra 270,000,000 kilos of rice as the result of prosperity and a betterment in the standard of living. About 160,000,000 kilos were imported, and 110,000,000 kilos were produced in the Islands. If the average consumption per capita for the seven years 1910-1916, 79.5 kilos, is selected for a basis, an even more favorable condition is indicated.

These figures show that the production of rice had increased in much greater proportion than population. Imports of rice continued only because general prosperity had increased in the Philippines, resulting in increased purchasing power of the people. The people were consuming more rice per capita.¹

¹ This same phenomenon was noted in Japan, where the increased income of the people during the war was to a considerable extent expended in buying more rice to eat.

People have a right to satisfy their hunger, and every country should build up a surplus stock of food against a failure of crops. The figures noted in Chart III should not be interpreted as meaning that the Islands are now economically independent, so far as their basic food is concerned. Moreover, even with the very favorable conditions of 1918, the margin of safety was too small. If in 1918 the same unfavorable conditions of weather had prevailed as in 1912, a disaster could not have been averted, for it would not have been possible to secure sufficient rice from French Indo-China, Siam, or Burma to last until the next crop matured. The figures do indicate a most satisfactory development in the domestic rice industry, a development which shows that the Islands are able to produce their own food and to maintain an increased production of export crops. The large crop of 1918 was the result of the increased area given to rice and the large yield per hectare. The average area for the previous eight years had been 1,024,000 hectares; in 1918 it was 1,368,000 hectares. If profits remain attractive and animal diseases are held within control, this area will doubtless be increased. The yield per hectare of 732 kilos in 1918 was about 200 kilos greater than the average of the eight previous years. This yield was largely due to favorable conditions, but there was undoubtedly some permanent increase in yield per hectare by reason of better methods of cultivation.

The old problems of increasing the area and yield still remain, but it is possible that the Philippines may become independent of other countries for the basic food; if not entirely independent, at least for the proper amount of rice required to feed the population. The problem of distributing the surplus domestic crop must also receive attention. The table of production and consumption by provinces indicates that the surplus stock is nearly all in the Central Plain of Luzon. The problem is to move this and distribute it to the provinces where annual shortages occur. An improvement in railroads would be of assistance. The establishment of

warehouses, especially if under government control, would do a great deal to stabilize the industry. Farmers could then receive a fair price for their crops immediately after harvest; hoarding and speculating would be prevented; and there would be a supply of rice for emergencies.

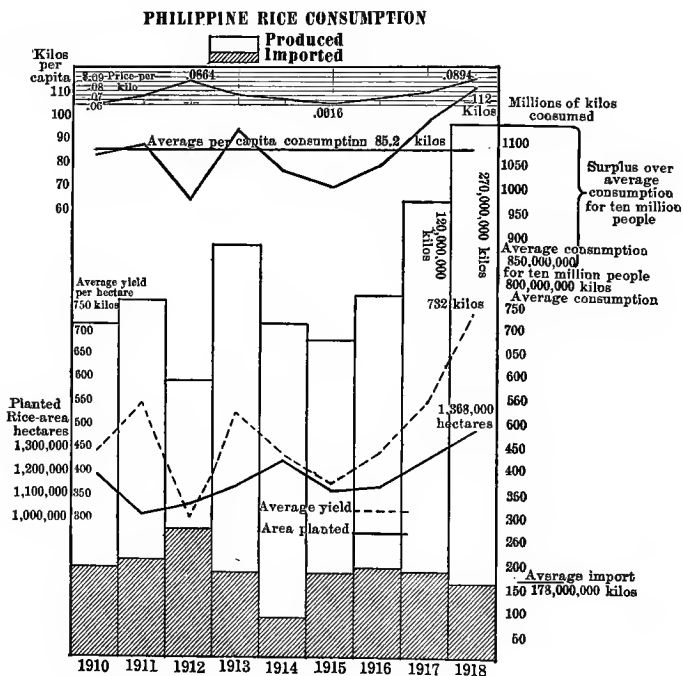


CHART III. PHILIPPINE RICE CONSUMPTION

THE RICE INDUSTRY OF THE FUTURE

Chart III indicates that the five factors in the increased production of rice have received attention, but it is yet too soon to forecast whether rice imports into the Islands will undergo a general decline or a general increase. The general level of rice importations will depend largely on (1) the

increase or decrease of the volume of Philippine exports ; (2) the availability of work animals ; (3) the extension of systems of irrigation ; (4) improvements in methods of cultivating and reaping ; (5) the standard of living and the purchasing power of the Filipinos ; (6) the increase in population ; (7) the facilities for transportation ; (8) the general world conditions influencing the production and consumption of food stuffs, and consequently the supply and the price of rice. In any year the climatic conditions during the rice season, the general conditions for health, and factors influencing the domestic and Saigon rice market, will determine the amount of the Philippine harvest and import. The price will be determined by the price of rice in Saigon, which is in turn fixed by the size of the crop there and by the world's demand for rice.

SUGGESTIONS FOR REVIEW AND ORIGINAL WORK

SUGGESTIONS BASED ON THE TEXT

1. With the present agricultural methods and conditions in the Philippines, is the rice import beneficial or not ? 2. Do you believe that the imports of rice into the Philippines will increase or diminish ? Why ? 3. What percentage of the rice used in the Philippines is raised here ? 4. What percentage is imported ? 5. Why is it that the price of rice in Saigon fixes the price of rice grown in the Philippines ? 6. It was thought that the remission of the duty on rice in 1918 would effect a general reduction of from ten to fifteen per cent in the prices. Why ? 7. To make the Philippines self-sufficing how much must the normal rice crop be increased ? 8. Explain how it might be increased to this point on the present area normally given to rice.

9. Explain some abuses and give instances of lack of system in producing and marketing rice in the Philippines. 10. If the Philippines were blockaded, or shipments of rice were cut off, what steps would you propose for the immediate supply of food for the Islands ? 11. If the supply of imported rice were gradually diminishing, what steps would you take to have the domestic supply permanently increased to meet the domestic demands ?

12. Explain the value of different kinds of rice on nonirrigated lands with respect to the period required to reach maturity, and the normal seasons of planting and harvesting; on irrigated lands with respect to the production of more than one crop a year.

13. A comparison of the intensive cultivation of rice in the Philippines and of its extensive culture in the United States.

14. Can agricultural machinery be used in cultivating rice in the Philippines?

15. Prepare a chart showing in terms of value what percentage the rice imports are of the total imports since 1899. 16. Smooth the curves by averaging the percentages by fives. 17. Interpret this chart, taking into consideration the fact that Philippine imports and exports have increased in about the same proportion.

18. What are the three great problems connected with the Philippine rice situation? 19. What are the five most important factors with respect to increasing the production of rice?

20. Should there be a high duty on rice imported into the Philippines? Explain your answer. 21. What is the present duty?

22. What is the effect of the increased population on the rice question? of the increased prosperity and purchasing power of the people?

23. From the table on rice mills name the provinces where rice is raised commercially, and check your deductions from the table on rice production and consumption by provinces.

24. Explain how a better system of transportation will affect the rice problem in the Philippines.

25. In normal years a considerable amount of rice is fed to live stock, especially horses and chickens; does this consumption of rice affect to any great degree the figures given in the text?

26. The following item of news is taken from a Manila paper of August, 1919:

In the province of Sorsogon a man has been killed for half a cavan of rice. He had purchased the rice at the market and was returning home through fields of abaca, when he was set upon by four or five men and killed, the murderers escaping with the coveted rice.

Comment on this.

RICE PRODUCED AND CONSUMED (JULY 1, 1917-JUNE 30, 1918)

PROVINCE	CROP ¹	CONSUMED ³	SURPLUS	SHORTAGE
	<i>Cavans</i> ²	<i>Cavans</i>	<i>Cavans</i>	<i>Cavans</i>
Abra	138,142	133,870	4,272	
Albay	298,679	600,130		301,451
Ambos Camarines	366,608	601,885		235,277
Antique	208,016	328,400		120,384
Bataan	133,768	105,300	28,468	
Batanes	141	17,860		17,719
Batangas	323,003	588,805		266,802
Bohol	350,588	632,500		281,912
Bulacan	781,514	516,340	265,174	
Cagayan	321,757	395,265		73,508
Capiz	653,048	589,390	63,658	
Cavite	414,471	323,485	90,986	
Cebu	51,728	1,495,320		1,443,592
Ilocos Norte	635,798	380,935	254,863	
Ilocos Sur	265,206	351,000		85,794
Iloilo	1,285,063	934,440	350,623	
Isabela	16,876	202,840		185,964
Laguna	272,042	360,305		88,263
La Union	492,187	304,960	187,227	
Leyte	475,198	982,860		507,662
Manila, city of		546,895		546,895
Mindanao and Sulu: Agusan	9,309	122,615		113,306
Bukidnon		119,455		119,455
Cotabato	8,257	200,595		192,338
Davao	20,731	225,790		205,054
Lanao	16,283	163,510		147,227
Sulu	175	227,080		226,905
Zamboanga	42,623	256,505		213,882
Mindoro	102,109	131,000		28,891
Misamis	98,309	363,850		265,541
Mountain	250,593	795,735		545,142
Nueva Ecija	2,267,632	345,150	1,922,482	
Nueva Vizcaya	97,058	71,215	25,843	
Occidental Negros	413,726	850,650		436,924
• • • • • Oriental Negros	56,565	544,750		488,185
Palawan	13,797	133,790		119,993
Pampanga	772,119	554,775	217,344	
Pangasinan	2,585,344	1,099,020	1,486,324	
Rizal	342,315	370,830		28,515
Romblon	63,525	135,800		72,275
Samar	140,069	668,070		528,001
Sorsogon	75,610	412,990		337,380
Surigao	189,664	241,645		51,981
Tarlac	1,019,161	344,565	674,596	
Tayabas	360,649	521,860		161,211
Zambales	321,011	227,255	93,756	
Total	16,750,472	19,521,285	5,665,616	8,436,429

Net shortage for the Philippine Islands in 1918 2,770,813

¹ Bureau of Agriculture.² One cavan = 57½ kilos.³ Estimated.

27. Comment on the following item of news also :

Hunger is already threatening. It is leading an element of the people to something like madness. It has been rumored that a band of "mal-hechores" is somewhere in Nasugbu, a neighboring municipality. No depredations have as yet been reported as committed by them, but it is apparent that they are capable of doing much harm to the community. The people are uneasy, and are on the lookout for impending danger. With this condition of affairs, living in this neighborhood is far from peaceful.

The constabulary also received reports yesterday from Iloilo and Samar describing similar conditions.

Panic, rioting, disorder, hunger, and actual famine are all hinted at, or predicted, in two telegrams just received at constabulary headquarters in regard to the rice situation in the provinces of Samar and Iloilo.

The message received from the constabulary officer in command of the forces in Samar says that there is a rice crisis in every town of the province, including Catbalogan.

The telegram says that rioting and general disorder is a possibility at the present time, and that the general situation is certain to become dangerous if a shipment of rice does not arrive there soon. In the interior of the province, the message says, the people have enough corn and root products to satisfy their immediate hunger, but the rice shortage is being felt in every town of the province.

In August, 1919, an article appeared in the Manila papers stating that unless the people ate seventy-five riceless meals before the next harvest, famine would result. This recommendation was based on the following figures : a population of ten million people for the Islands ; importations from Saigon in 1917 (147,000,000 kilos of rice) were higher than those of 1918 ; the native crop of rice of 1918-1919 was larger than that of 1917-1918 ; the average consumption per capita is 112 kilos per annum, or 307 grams a day. According to the figures above the Philippines require 402,700 kilos of foreign rice a day to meet the necessary consumption of the Islands. From the date in question until the rice harvest in December there were 150 days, which indicates a shortage of 60,405,000 kilos.

28. What essential point did these figures not take into consideration ? 29. Prove from the same figures used in this article (Chart III) that the shortage did not necessarily exist.

30. From Chart I why do you think a large rice area was planted in 1919?

SUGGESTIONS FOR THE STUDY OF LOCAL CONDITIONS

1. Forms of seed selection in local rice fields. Make a list of local varieties of rice, explaining the characteristics and points in favor and against each. Bring in samples.

2. Write a description of a rice mill, comparing the different operations with cleaning by hand.

3. Bring in a report as to how rice culture in your province might be improved; how the cost of production and marketing might be reduced.

4. Bring in a paper making recommendations as to the re-establishment of old temporary dams and irrigation systems in the locality.

5. Describe the control of commercial stocks of rice in your locality and province.

SUGGESTIONS FOR REPORTS FROM REFERENCES, ESPECIALLY FROM COMMERCIAL GEOGRAPHIES

1. Make and explain a chart showing the uses of rice. 2. Explain the control and prevention of beriberi.

3. From the latest "Statistics on Principal Crops of the Philippine Islands" prepare a chart representing the amount of rice production of the Philippines. 4. Divide it into sections representing the production of the chief rice-producing provinces. 5. Compare these. 6. From the table on rice production and consumption by provinces, and by referring to Miller's "Commercial Geography" and Miller and Polley's "Intermediate Geography," prepare a map of the Philippines showing the regions of rice export and import, and those regions producing enough rice for local consumption. 7. Explain the reason for the importation of rice in each case.

8. In August, 1919, it was estimated that the crop of 1919 would be one third less than that of 1918. At the average consumption per capita for the previous nine years, would this

crop have been sufficient to feed the population of the Philippines? 9. If not, how much rice would have been required in addition?

10. From the statistics of the Bureau of Agriculture determine what the rice crop of 1919 actually was, and answer these questions as to its sufficiency and the amount of import required.

11. Describe the production, harvesting, and marketing of wheat, and the milling of flour in the United States. 12. Make a comparison of its problems with the problems of rice growing and marketing in the Philippines. 13. Could a similar organization for marketing rice be developed in the Philippines? (Brigham, pages 1-21.)

14. Some capitalists have become interested in the development of lands in the Cotabato Valley and the Central Plain of Luzon. Both areas are capable of irrigation. They have decided to plant rice extensively. You are appointed by the directors of the company to bring in reports as to the feasibility of the two schemes. Do so, making use of the charts of rainfall in Miller and Polley's "Intermediate Geography" in so far as the seasons of rainfall are concerned.

15. Make a study of Act Number 2818 of the Fourth Philippine Legislature, an act to encourage the increase of the rice and corn production in the Philippine Islands, etc., and bring in a report of what the government has done, and the success that has attended the application of this law to the Philippines as a whole, and to your locality.

16. The food-importing and the food-exporting countries of the world.

17. Discuss the difference in the effect of submarine warfare on the food supply of Great Britain and of France; the effect of the blockade of Germany on its food supply.

18. Secure the necessary data from the latest annual report of the Collector of Customs, and bring Chart I down to the present time. 19. Comment on these new figures, in relation to those of former years.

20. Obtain from the Bureau of Agriculture the data necessary to bring down to the present the table on the annual rice yield in the Philippines. Make a chart representing these figures. Compare it with Chart I, Philippine Rice Imports. 21. Explain the

causes for the extraordinarily high imports of rice in terms of Chart I and this chart; for the unusually low imports.

22. Describe the world's production of rice and the rice trade (Finch and Baker; Miller; Toothaker; Brigham), making careful comparisons with the Philippines.

STUDIES FROM THE PHILIPPINE CENSUS OF 1918 (WHEN AVAILABLE)

1. The rice industry of the Philippines. 2. Rice mills in the Philippines.

CHAPTER III

CORN AS A FOOD CROP¹

IMPORTANCE IN THE WORLD

As compared with wheat or rice, corn has, in the world's market, a rather peculiar status. Although the world's corn crop is larger than that of wheat or rice, the comparative amount of corn directly consumed as a human food is small. Probably the chief reason for relegating it to the position of an animal food is the coarse and rough texture of corn meal when the ground fibrous hull is present. The people of wheat-eating countries are prejudiced against corn because of its color and the unfitness of its meal for porous bread. The protein of corn, unlike the gluten of wheat, is not elastic, and the bread is granular rather than porous. Moreover, corn bread is not so attractive as wheat bread, and does not keep in good condition so long. In the Orient it is compared unfavorably with rice, since it has to be cooked nearly twice as long, and in tropical countries generally it has found less favor on account of the ease with which weevils destroy it when stored.

Corn has therefore become the chief food in but few regions of the earth, although in many countries it is an important supplementary food. Throughout the world it has been used mostly in the fattening of hogs and cattle, and in several important manufacturing industries. In recent years, however, the value of corn for direct human consumption has been more thoroughly understood, and methods of preparation have been developed by which this grain can be made more digestible and more appetizing. The chief advances made in the commercial preparation of corn have been in separating the hull from the meal, thus increasing its digestibility, and in

¹ *Bulletin 23*, Bureau of Agriculture, Manila, 1912.

eliminating the germ, thus preventing the meal from becoming rancid. In the United States, especially, these improvements have been undertaken in an organized manner, and corn propaganda has spread even to Europe in the attempt to educate people in the proper preparation of corn for food. During the World War the people of the United States were able to conserve millions of bushels of wheat by substituting corn for wheat on their tables; in Europe corn was mixed with wheat and other cereals in making bread.

Corn surpasses all other crops in the return for the labor expended. In the United States such a large area is devoted to corn that even a slightly increased yield per hectare gives an aggregate increase of considerable value. The farmers of the corn belt obtain increased yields by improved methods of tillage and seed selection. These new methods and ideas, which are worked out in colleges and experiment stations, are brought to the farmers by different means. Among the most effective means is that of special railroad trains, fitted up as lecture halls and provided with corn experts, who are thus sent throughout the corn-growing area to advise the farmers. Much of the expense of these trips is borne by the railroad companies, who consider it a good investment, since the returns from the increased amount of freight given them by the larger crop more than recompense them for the outlay. Bulletins, the introduction of the study of corn growing in the public schools, farmers' corn-growing coöperative clubs, and special corn demonstrators have also been effective.

Though the total amount of corn produced in the United States shows a steady increase, the demand keeps pace with the supply. Since 1901 the world's production of corn has increased much faster than that of other cereals.

IMPORTANCE IN THE PHILIPPINES

Corn was introduced into the Philippines from Mexico. Its social status in the Islands has been low, for it has generally been known as "poor man's rice." In 1912 the value of the

corn crop was one eighth of that of rice, but the increased interest manifested in corn since 1912 has resulted in greater production. Now the people are beginning to understand its value as an article of human diet and as fodder for horses and carabaos; and they are coming to realize that a large return may be expected from the amount of seed planted even when grown under poor conditions. In 1917 the value of the corn crop had more than doubled, and was one fifth of that of rice. The following figures indicate the increasing area devoted to corn:

YEAR	HECTARES	YEAR	HECTARES
1911	302,516	1915	443,048
1912	340,916	1916	432,766
1913	383,709	1917	429,293
1914	421,309	1918	418,386

In certain districts of the Philippines corn is the chief food of the people throughout the year. These districts probably include one fifth of the total population of the Islands. Unlike rice, corn demands a fairly porous soil, which will not hold water. Hence the coralline limestone soils found on Cebu, on Siquijor and in Oriental Negros, and in parts of Occidental Negros and Bohol are devoted to corn, and this cereal is the staple food in these localities. It is also the chief food crop in the upper part of the Cagayan Valley, which is the great tobacco region. Corn is planted there as a second crop after the tobacco has been harvested. In certain districts now producing export crops (for instance, parts of Misamis) corn was formerly the chief crop and food. A scarcity of animals is given as the principal reason for the diminished cultivation.

Fish, meat, and beans supplement corn, though fish is probably used to a less extent in these regions than in rice-eating districts.

Corn may be crushed and ground into coarse meal in primitive stone mills run by hand, in which two or three days' supply can be prepared at one time. By sifting and blowing, much of the husk is removed; the remaining meal is put into a pot of boiling water and cooked about fifteen minutes (half

PHILIPPINE ISLANDS

CHIEF FOOD CONSUMED

 Rice

 Corn

 Tubers

(Statistics from Economic Reports,
Bureau of Education)



CHART IV

the time required for complete cooking). In the Cagayan Valley the kernels are soaked for about a minute and then pounded in a mortar with a pestle, a long task. By shaking and sifting, the large pieces of the inner portion of the kernels are separated. The finished product is known as corn rice; it is usually cooked about half an hour before being ready to eat.



CORN STORED ON FRAMEWORK

It is interesting to note that in the corn-eating regions of the Philippines the wealthier persons usually live on rice, and that rice is often served by the poor on special occasions. Nevertheless, in certain regions in which corn was formerly the chief food, but in which it is now displaced by rice on account of the availability of rice in exchange for export crops, many of the inhabitants still prefer corn and will put themselves to much inconvenience to procure it.

The importance of corn as a supplementary food varies considerably in different parts of the Islands. In some regions, such as parts of northern Mindanao, Leyte, Bohol, Masbate, Batangas, Bulacan, and Abra, corn almost equals rice in the amount consumed. In other regions it occupies a minor place in the diet of the people, and in some localities it is scarcely eaten at all. As a supplementary food, corn is much grown on hill lands in kaingin, either by itself or as a catch crop. It is sometimes planted as a catch crop with sugar cane, and as a second crop after sugar cane or rice. In many regions

corn is planted in small patches here and there among main crops. Since corn requires less moisture than lowland rice and yields food in three or four months after planting, it often becomes an important crop after or during rice failure. As a result of the drought of 1911-1912, corn became an important crop in many regions of the Philippines, such as the Central Plain of Luzon and Laguna Province.

In regions where corn is not the chief food the form in which it is usually eaten differs somewhat according to its importance in the diet of the people. In those districts where corn constitutes the largest part of the diet during half the year, it is eaten in the forms previously explained. Where it is of considerable importance throughout the year, it is often ground to a meal and mixed with rice to make the rice go farther. It is consumed to give variety to the regular diet; or it is eaten between meals, boiled or roasted on the cob. In a few places the people know how to prepare corn by removing the hull. Parched corn is eaten throughout the Philippines, and is often carried by travelers.

In those localities where little corn is used, only one crop is grown; but in most districts two crops, and, in many regions where corn is the chief food, three crops are produced annually.

The cultivation of corn in the Philippines is as crude as the methods followed in the production of rice. Preparation of the soil is inefficient, seed selection is lacking, too many stalks are grown in a given space, and fertilizers are employed sparingly if at all. Corn is also lost by the attacks of pests in the field. On an average about fifteen cavans of corn per hectare are produced. In the United States the average yield per hectare is thirty cavans.

At the present time corn is stored in three ways in the Philippines: (1) the whole ear, including the husk, is fastened to a framework or to the side of the house, end down and fully exposed to the sun; (2) the ears are tied together, thoroughly cured in the sun, and stored under the roof of the house, where smoke assists in protecting them from weevils;

(3) where corn is not to be kept very long it is shelled, thoroughly dried in the sun, and stored in large baskets; shelled corn, however, is liable to attack by weevils.

The difficulty of storing corn makes it a crop to be consumed soon after harvest. This is no slight discouragement to planting it.

INCREASE IN PRODUCTION AND USE

The increased production of corn in the Philippines is due to encouragement of the government.¹ Reasons for promoting the growth of corn are found in the following conditions: (1) corn is an excellent human food when rightly prepared; it becomes an important food crop where rice cannot be grown, and as a supplementary food it proves of great importance in connection with rice and during failures in the rice crop; (2) on account of the possibility of three crops a year and the large yield per hectare corn is a good crop to raise for sale; (3) the leaves of corn make excellent fodder, the gathering of which in no way diminishes the yield of grain; this is an important consideration, for at the present time the Philippines are deficient in food for stock.

As has been previously stated, no other crop responds so readily to intelligent labor as does corn. A few points may be briefly noted:

1. The better cultivation of the soil and the improvement of implements necessary in producing rice (see pages 42-44) are also essential factors in the cultivation of corn.

2. The question of seed selection is particularly important with corn, for many of the local problems may be solved by foresight in this matter. These problems are (a) to secure an

¹ The Bureau of Agriculture met with particular success along the railroad in Panay. During September, 1911, the railroad handled 18,000 kilos of corn from Iloilo Province; in September, 1912, it handled 400,000 kilos, a gain of more than twenty-two hundred per cent. While the increased yield in the Islands during the Corn Campaign was partly artificial, much of the increased area planted at that time has been continued.

increase in the amount of corn grown, which will result from the production of two ears on a plant and a greater number of seeds to the ear; (*b*) to have the ear grow on the lower part of the stalk, and thus reduce the liability of its being destroyed by winds; (*c*) to produce a hard flint variety combined with high yield; (*d*) to produce an ear hanging downward, as a prevention to the entrance of rain.

3. Fertilizing is very important. Barnyard manure, green vegetable matter growing in the fields and carefully turned under, and commercial fertilizers all result in a largely increased yield.

4. Corn in the Philippines has always been planted too thick. If the proper distance is maintained between rows, and between the plants in the row, a large increase in the yield can be expected. The system of growing legumes, such as cowpeas, green gram (mungos), peanuts, and the like, between the rows of corn would also



A PLOT OF CORN

tend to produce a larger crop and to increase the fertility of the soil. At the present time practically no rotation of crops for preserving or increasing the fertility of the soil is practiced in the Philippines. If corn were rotated with tobacco, cowpeas, peanuts, upland rice, and millet in proper sequence, the exhaustion of the soil would, to a large extent, be prevented.

It has been shown that corn planted without effort to obtain the best results yielded from a given area ten and a fourth

pounds of seed; that corn on the same area, when planted regularly in rows a half meter apart and frequently cleaned and hoed, gave about six times the amount of the first crop; and that corn again on the same area, when planted in rows a meter apart and given the same cultivation, produced more than nine times the amount of the first crop.¹

Improvements in the method of preparing corn will also result in a greater appreciation of it as food. As a substitute for the crude stone mill, there have recently been imported small steel mills. The cheapness of these renders it possible to place them in every small community if not in every household. If corn is to be elevated from its lowly position as "poor man's rice," the people must understand more thoroughly the methods by which palatable foods may be prepared from it, and the necessity of longer cooking. This matter has received attention and publicity; with the increased production of corn already noted, there has been an increased use of it as a supplementary food, and, to a smaller extent, as a chief food in connection with fish, beans, and other products high in protein.

The great problem which confronts the small producer of corn in the Philippines is to obtain better and cheaper methods of preserving the grain over a longer period of time than is now practicable. Treatment with carbon disulphide (much practiced in the United States) is impracticable here on account of the inflammable nature of the gas. It would seem that unless some herb or other simple insecticide is found, the evolution of a hard flint variety of the grain is the only practicable solution of the difficulty. For commercial purposes large amounts of shelled corn may be protected by means of carbon disulphide.

¹ *Agricultural Review*, Vol. III, No. 8.

SUGGESTIONS FOR REVIEW AND ORIGINAL WORK

SUGGESTIONS BASED ON THE TEXT

1. What are the points against extensive production of corn in the Philippines? 2. Where is it used as the chief food? Why? 3. What is its place in the diet of the people in other parts of the Islands? 4. Explain the chief problems of producing and marketing corn in the Philippines. 5. If all the Filipinos should suddenly substitute corn for rice, what would be the effect on the economic condition of the country? 6. Is such a change desirable? 7. State the comparative food values of corn and rice.

SUGGESTIONS FOR THE STUDY OF LOCAL CONDITIONS

1. Corn as a crop and as a food. 2. Varieties of corn recognized.

SUGGESTIONS FOR REPORTS FROM REFERENCES, ESPECIALLY FROM COMMERCIAL GEOGRAPHIES

1. From the latest "Statistics on Principal Crops of the Philippine Islands" prepare a chart representing the amount of corn produced in the Philippines. 2. Divide it into sections representing the production of the chief corn-producing provinces. 3. Compare these. 4. Explain the causes for the heavy production of corn.

5. The world's corn industry.¹

6. The relation between the corn and the hog industry of the United States.¹

7. Make and explain a chart of the uses of corn.

8. The cereal foods of the world: where they are grown and used; comparative production; comparisons with those of the Philippines; international trade; which are or can be grown in the Philippines; why the others cannot be grown.¹

9. Make and explain charts showing the uses of wheat, rye, oats.¹

¹ See Finch and Baker; Miller; Toothaker; Bishop and Keller.

CHAPTER IV

LESSER FOOD CROPS

SUPPLEMENTARY FOODS

While rice or corn is the chief food in nearly all parts of the Philippines, certain other crops are supplementary.

The sweet potato is widely used as an important supplementary food to rice; indeed, in certain inland mountainous regions of the Islands it is the chief food. The cultivation of this crop by the Igorots, on account of the lack of suitable rice lands in their country, has already been noted (see Chapter I). The same reason for its cultivation holds among the Filipinos also. In the Batan Islands sweet potatoes and other roots and tubers constitute the chief crops, not only because ground suitable for rice is not obtainable, but because the high winds which accompany the frequent typhoons destroy or badly damage the vegetation.

The social position of the sweet potato in the Philippines is much lower than that of corn. To say "They live on camotes" indicates, in most regions, a state of abject poverty.

The nutritive value of the sweet potato lies almost entirely in its starch, the protein and fat being negligible. The amount of sugar in the Philippine camote is small. Beans, fish, or other foods high in protein should be eaten with the camote.

In many regions, particularly where it is the chief food, the camote is planted in separate fields. It is often grown as a second crop after rice, or as a catch crop between other plants. No attempt is made to cultivate carefully or to improve this root. As a general food, the sweet potato attains its greatest importance just before rice planting. At all times of the year it is eaten between meals.

Of the numerous species of yams, several are found wild or cultivated, and are probably the second most important supplementary food. These roots are sold in nearly all markets of the Islands; their place in the diet of the people is much the same as that of the sweet potato. In certain localities they are used with sweet potatoes as the chief food, but in most places their value is purely supplementary, in varying degrees. The yams are peculiarly immune to the effects of drought and are therefore excellent dry-season crops. Their food value lies almost entirely in their starch.

Taro is found in all markets. This root, however, is nowhere a principal or even an important food. Since its cultivation requires considerable moisture, it cannot be advantageously grown during the dry season except along streams. It is a starchy food.

The value of cassava roots as food is not well understood in the Philippines in general. In the Sulu Archipelago cassava is the chief food; in other parts, however, it is seldom used except in times of great need. Among other supplementary food crops may be mentioned the arrowroots, the millets, the beans, and the palm starches, but the amounts of these consumed in comparison with the foods noted above are small indeed.

FOODS OF LUXURY

Foods of luxury raised and eaten by the Filipinos are not numerous, nor of great quantity.¹ The most important are the fruits. In the Philippines there is practically no cultivation of fruit, no orchards or organized systems of obtaining and disposing of fruit. The trees are simply allowed to grow, and the product is gathered when ready. There is not a fruit grown in the Philippines the yield of which could not be increased in quality and in quantity by careful propagation and cultivation. Mangoes are produced generally, and are

¹ Luxuries include foods eaten not for their nutritive value particularly, but as relishes at or between meals.

exported from certain favorable localities in large quantities. During a short season mandarins¹ are sent from the groves of Batangas and two or three small centers. Lansones, which grow here and there in the Archipelago, are exported principally from southwestern Luzon. Pineapples, chicos, guavas, tamarinds, papayas, and other fruits are produced locally and enter trade to a small extent.² Of these the papaya is the most utilized. In general, fruits contain but little nourishment in comparison with their bulk; this nourishment consists usually of sugars. Fruits aid and stimulate digestion rather than give nourishment to the body. In the Philippines green fruit is preferred, and consequently the nourishment which is developed in the ripe fruit is lost.

Unlike most fruits, however, the banana contains a large amount of nutrition and has a distinct food value, especially when cooked. The place of the banana in the diet of the Filipinos is peculiar, and varies with the kind of fruit and the locality. The best kinds of bananas are considered luxuries for the table of the well-to-do, and bring a relatively high price in all parts of the Archipelago. The commoner varieties are the chief food in a few barrios³ throughout the year or during a large part of it. Probably in half the municipalities of the Philippines the banana is a recognized supplementary food, and enters into the diet of the people as largely as do the root crops and corn. In the other municipalities even the inferior varieties are considered luxuries, and very few are eaten. The cause of this great difference in the use of the banana lies in the inadequate local production, which is due to neglect or unfavorable location. In no place in the Philippines is the demand for bananas fully met. About Manila, Cebu, and Iloilo there is a small trade in the fruit, and the fruit is found in the markets of most towns. The largest

¹ Known locally as the Batangas orange.

² For discussion of these fruits see "Commercial Geography, the Materials of Commerce for the Philippines," by Miller, Bureau of Education, Manila.

³ The Philippines are divided politically into provinces, municipalities, and barrios.

supply which the provincial householders possess is that obtained from plants grown in their own yards.

Other domestic luxuries consumed by the Filipinos are sugar, onions, garlic, coffee, chocolate, buyo (betel), tobacco, and certain fermented drinks such as palm saps (tuba) and basi. Sugar enters the composition of numerous sweetmeats (dulces) made from other foods already mentioned and the meat of the coconut. Garlic and onions are greatly appreciated for flavoring foods. With those who have the means coffee or chocolate is drunk with the morning meal, and chocolate in the afternoon. The smoking of tobacco is a luxury freely indulged in by all classes. The chewing of buyo, however, seems to be growing less. The wide consumption of distilled liquors will be discussed in another place. Fermented juices are also important. In the Visayas immense quantities of fermented coconut sap are drunk, and among the Ilocanos fermented sugar-cane juice (basi) is used by all classes. A small amount of fermented nipa sap is consumed near extensive swamps covered with nipa palms.

FAMINE FOODS

In the discussion of the chief food crops it has been intimated that famines sometimes occur in the Philippines. This term, however, is almost too strong to apply to any conditions found in the Islands. It usually suggests periods in India and China when thousands die from want of food. Such a condition, however, is not even approached in the Philippines. In the worst times a few hundred persons, mostly old people and children, may die of malnutrition. The Philippines are not densely populated, and in times of necessity the people can resort to wild foods. Two different conditions of famine should be noted: (1) annual seasons of restricted diet resulting from too small production of food; and (2) extraordinary times of food scarcity caused by unusual drought, storms, or epidemics.

During the regular annual periods of food scarcity which occur in certain backward communities, it is customary to make the chief food go farther by adding less appreciated foods. Thus in rice-eating regions ground corn is added to the *morisqueta*,¹ and more root crops are consumed. In corn-consuming regions the people resort to cultivated roots and even to wild roots and starches from wild palms. In the most backward communities the coarsest forms of wild food supplement the chief diet. In these localities the period of famine is a time of real want, when the hunger belt must be drawn tight. Such annual periods of food scarcity occur, of course, only in the less progressive and poorer districts of the Philippines, but they are of sufficient importance to be noted as a condition, and not as an exception.

From time to time extraordinary periods of restricted food supply occur in certain localities or throughout the Islands. In the most advanced and richest regions, in which there is diversity of production (as Laguna and Pangasinan), or where the land is given over to a successful export crop (as the present coconut region of Tayabas), drought has no serious ill effect on the people. But where the population is dependent on one food crop or on an export crop which brings a low price, the effect of curtailment in food is often keenly felt. Here again the results of the famine depend on the character of the population. In the least civilized parts of the Philippines the people take to the hills and live on roots and other wild food until they can plant and harvest another crop. In more advanced localities the people resort to less appreciated foods. In rice-producing regions corn is usually planted, since it furnishes food more quickly than rice and requires less water. In many parts of the Islands more yams and vegetables are also eaten at such times. The most important sources of nourishment during the scarcity of cultivated foods are the palm starches. In some places palm starches are regularly included in the diet, such as buri starch on the Bondoc Peninsula, the

¹ Boiled rice.

starch of the sugar palm in Mindoro, and the starch of the sago palm in the northeastern portion of the Agusan Valley. But for the Philippines in general the palm starches may be considered foods of necessity, used only in times of scarcity. In coconut regions tuba is drunk to a larger extent during food shortage; taken with a little rice and fish, or corn and fish, in the middle of the day, it sustains life until the next harvest.

NEW FOOD CROPS

Certain food crops which are now seldom or never produced in the Philippines deserve much greater attention than they receive.

Among these the most important is beans. Three general classes of food are recognized as necessary for the proper nourishment of the body: the carbohydrates, which are obtained from starches and sugars; the proteids, which are found in fish, meats, beans, and the like; and the fats, which may be either animal or vegetable. The diet of the Filipinos is plentifully supplied with fats from pork and coconut oil, which are eaten universally. The proportion of starchy foods consumed by the Filipinos is too great. Rice and roots are almost entirely starch. Corn contains a considerable amount of protein, but is essentially a starchy food. At the present time protein is supplied largely by fish, to a less extent by meat, and to a still less extent by beans. In certain localities (particularly on the island of Panay and among the Ilocanos) beans are a notable feature of the daily food. Yet even in these places the nutritive value of beans in connection with rice is not well understood. The chief reason for eating beans is that they can be grown between main crops. For the Philippines in general beans are used much too sparingly. The varieties found in the small stores and markets of most towns are principally imported from China. Those grown by individuals are consumed by the family or in the immediate locality, except in a very few cases, as in Ilocos Norte, Pangasinan, and Antique, from which beans are exported.

The most important varieties of beans grown in the Philippines are the cowpea, which is usually eaten green ; the lima bean, which is found both wild and cultivated ; and the green gram, which is the most important of the local beans, and which is valued for its dried seeds. All these varieties are rich in protein. The use of beans in crop rotation with starch-producing plants is not understood in the Philippines. The cultivation of beans in connection with rice, corn, and root



A VEGETABLE GARDEN

crops would improve agricultural conditions and furnish the necessary protein to the diet of the people. The present varieties grown are suitable, but others might be introduced. Recently the world has taken interest in the soya bean, which is produced and eaten in large quantities in China, Japan, and India. This bean is a prolific source of oil in these countries and in Europe, and its general food value is becoming recognized to an ever-increasing extent. It is unusually rich in fat and protein, and contains practically no starch. The soya bean is not well known in the Islands, although quantities are imported from China and made into bean cakes or curds,

an excellent food, which is popular in the larger cities of the Philippines. The bean would be a good addition to the crops and foods of the Filipinos.

The diet of the Filipinos is deficient in fresh vegetables also. After all, variety in diet is largely a matter of habit, and the customs of the Filipinos have been such as to eliminate almost



AN EXHIBIT OF VEGETABLES FROM SCHOOL GARDENS

Results of propaganda on vegetables

all fresh vegetables except greens from their table. Near most houses there is a large space where a vegetable garden can easily be maintained, the product of which would be important not only in giving variety to diet, but in serving as food in times of scarcity. The schools in all parts of the Islands have taken up with great earnestness the planting of school and home gardens. In 1917-1918, according to the report of the Director of Education, there were 4023 school gardens and

103,668 home gardens. In nearly all towns there is a noticeable increase in the number of gardens about the houses, and in the amount of fresh vegetables eaten.¹

SUGGESTIONS FOR REVIEW AND ORIGINAL WORK

SUGGESTIONS BASED ON THE TEXT

1. Vegetables as an important factor in the national diet.
2. What constitutes a food of luxury in the Philippines?
3. Under what conditions do foods of luxury become common foods?
4. Under what conditions do common foods become foods of luxury?
5. Suggest a method of introducing new foods into a country.
6. What conditions render such a plan advisable?
7. Should any effort be made to reduce some of the present foods of luxury to the level of common foods?
8. If so, how would you develop this effort?

SUGGESTIONS FOR THE STUDY OF LOCAL CONDITIONS

1. Chief and supplementary foods. 2. Foods of luxury. 3. Foods used during periods of scarcity. 4. New foods that might be introduced.

5. A study of local bananas with respect to uses and quality (cooking, eating of various grades, vinegar); keeping and shipping qualities.

6. Local fruits and their varieties. 7. Those that might be produced commercially.

8. Has the consumption of vegetables increased?

SUGGESTIONS FOR REPORTS FROM REFERENCES, ESPECIALLY FROM COMMERCIAL GEOGRAPHIES

1. Philippine commercial fruits. 2. Where they are produced commercially. 3. Some problems connected with their production and marketing. 4. Orchards. 5. Possibilities of exporting fresh fruit from the Philippines. 6. The import of fresh and preserved fruits. 7. Fruits that might be introduced into the Islands. (Miller.)

¹ For a summary of the chapter on food crops, see Chapter XIII under the heading *The Standard of Living* (page 286.)

8. Growing, marketing, and preserving fruits and vegetables. 9. The industries in the United States. (Finch and Baker; Bishop and Keller.) 10. Lists of imported dried and preserved fruits and vegetables found in Philippine stores. 11. Philippine fruits and vegetables in relation to their possibilities of being preserved commercially.

12. Make and explain a chart of the uses of the banana.

13. The white potato: its cultivation and use. (Finch and Baker.) 14. Imports into the Philippines. 15. The cultivation and use of camotes and other root crops in the Philippines.

16. The banana: its cultivation and commercial uses. (Miller.)

17. Citrus fruits. (Miller; Finch and Baker.)

18. The school gardens of the Philippines: a review of the efforts made and the work accomplished.

19. The value of beans as food.

20. Possibilities of producing cassava and sago in the Philippines.

21. The production and consumption of cassava in Brazil.

22. Periods of famine in India and China. 23. Their causes and effects. 24. Remedies.

25. Periods of scarcity in the Philippines. 26. Their causes. 27. Foods eaten during times of scarcity. 28. Prevention of these periods.

29. The World War, and the food problem in Great Britain, France, and the United States. 30. How the problem was solved.

31. Vegetable foodstuffs imported into the Philippines.

32. The food supply of the United States. (Finch and Baker; Bishop and Keller.)

CHAPTER V

ABACA AS AN EXPORT CROP

The food crops of the Philippines are produced for consumption in the Islands. With the exception of rice they hardly enter commerce. Even rice is sent from only a few districts.

The export crops, on the other hand, are grown almost entirely for use in foreign countries, only a small part of each being consumed in the Islands. In exchange for these crops there are brought into the Philippines (1) necessary articles which cannot be made here, or which can be produced more cheaply in foreign countries, such as iron and steel goods and cotton cloth; (2) food, such as rice; and (3) luxuries, such as preserved foods, phonographs, shoes, and books. It is probable that the export crops equal in value those raised for local consumption.

HISTORY OF ABACA

For many years the most important export from the Philippines has been Manila hemp. The fiber-producing qualities of the species of *Musa*, called in the native languages abaca, was well known to the Filipinos long before the days of Spanish occupation. When Magellan arrived at Cebu, the weaving industry was already widespread. Levariza (1569) spoke of the great quantities of colored abaca cloths woven in the present province of Albay. Since the weaving and the use of the cloth were general among the natives, the Spanish government made the cloth legal tender for the payment of taxes. However, although weaving was a common household industry, this peculiar form of money was not easily obtained, and long arguments concerning the hardship of paying the taxes appeared from time to time in letters written to the Spanish king.

In ancient times the fiber was obtained from the wild plant. The cultivation of abaca was not begun until the early part of the nineteenth century; some abaca was exported in 1818. In 1824 the fiber was used extensively in New England shipyards. The amount of abaca exported, however, was not large until the latter part of the century. From 1850 to the present time production and export have increased rapidly; Figure I on Chart VI shows the increased volume of export from 1877 to 1918, inclusive.

The popularity of abaca in the regions in which it can be grown¹ is probably due to the following facts: it is not attacked by pests, such as locusts (which are destructive to rice and other crops), nor by any serious fungous diseases; it resists drought fairly well; not much labor need be expended on its cultivation, since it thrives in competition with other plants. Moreover, it has no particular season for harvest, and the laborers have more or less steady work throughout the year.

. LARGE AND SMALL PRODUCERS

In parts of the Philippines the fiber is still obtained from uncultivated varieties, although this product is inferior to that stripped from cultivated plants. In the older abaca districts the holdings are usually small, consisting at the most of a few thousand hills. These holdings are sometimes owned by the men who strip the fiber, and sometimes by the people who live in the lowlands. Such small holdings are probably the result of local scarcity of labor and the general immobility of labor. They also result from giving one family the care of just the number of plants it can cultivate and harvest. The small owners and producers are nearly always economically dependent on certain provincial abaca buyers. Through advances of money or food these buyers control the disposal of the debtors' product. The owners of several thousand hills

¹ See Miller's "Commercial Geography, the Materials of Commerce for the Philippines."

are in a much better position, and are usually independent of all buyers. In many of the newer abaca regions there are plantations of more than a hundred thousand hills, the owners usually being corporations, which are, of course, independent as to the disposal of their fiber.

STRIPPING

The amount of labor involved in planting abaca and in cultivating the plot (laté) or hacienda is comparatively small, but for the Islands as a whole sufficient labor to strip the fiber from the petiole has never been available. Most of the fiber is obtained by the laborious process of pulling the petiole under a knife by hand, as shown on page 101. This process requires not only great dexterity but great strength. The problem of the owner, therefore, is to find sufficient labor to strip his fiber. The wages of strippers usually consist of a certain share of the product. Formerly this share was one third, but for several years it has been one half of the fiber obtained. In certain places in which labor was particularly scarce, and which were particularly hard hit by the slump in prices of a few years ago, even more than a share of one half has been given the strippers, but on condition that they do the cultivating also. It is considered obligatory on the stripper to sell his share to the owner of the plantation so long as the latter pays a reasonable price for it, this price being slightly less than that of the open market. Hence, in the end, the total product of the plantation usually passes into the hands of the owner. In a few large plantations daily wages are given.

In 1903 a hemp stripper with helper could earn from ₱2 to ₱2.50 a day.¹ At the low prices of 1911, however, a laborer and helper could not make more than half that amount. In 1918 strippers averaged about ₱4.50 a day. Because of the laboriousness of stripping, it is not customary for the strippers to work continuously. They usually strip hemp three days a week and devote the other three days to cleaning

¹ *Bulletin 58*, Bureau of Labor, Washington, D.C.

the laté. Hence, no matter what the price is, the strippers' average annual income is probably no higher than that of laborers working in other agricultural pursuits.

The strippers in most abaca districts are dependent on the crop for a living, and usually dwell with their families on the latés. They themselves do not raise any food crops or domestic animals suitable for food, nor are they encouraged to do so by the men who hire them. This condition, as we shall see later, results in an exodus of strippers from the abaca fields to the rice fields, or to other industries, when the price of the fiber is so low that stripping does not yield a good living.

TRANSPORTATION

Another important consideration in the production of abaca fiber is that of transportation. Usually the abaca latés are in the hills, and the cost of getting the fiber to the coast, if river transportation is not available, is often a difficult matter. When the price of abaca was high, as in 1903-1906 and in 1918 (see Chart VI), the strippers could afford to carry the product by horse or carabao, or even on their own backs, over trails or across mountains to the nearest coast towns to exchange for rice and cloth. From these places it was taken to Manila or Cebu for shipment to foreign countries. When the price of abaca fell, however, strippers no longer obtained sufficient goods for their load to warrant carrying the fiber to market, and many interior regions, such as the mountains of Samar and the Bukidnon country of Mindanao, practically ceased to export. In general, when the price is low, much abaca goes to waste on the stalk in those regions from which transportation to the market is expensive.

QUALITY

The quality of abaca fiber is an important consideration, and can be controlled in the stripping. The abaca exported from the Philippines has deteriorated greatly; this is made

plain by a comparison of the exports of 1881 with those of 1903 (as reported by a certain firm). This comparison has been given in graphic form in Chart V. It will be seen that by 1903 the second grade, which composed 61.8 per cent of the product of 1881, had almost disappeared; that the largest part was fourth grade, very little of which had been produced in 1881; and that a new or fifth grade was being largely produced. The general quality of the fiber has become even lower since 1903. This lowering in quality results from (1) the use of serrated knives, which give a larger yield with less effort, but which obtain a coarse abaca discolored by pulp; (2) delay in stripping the separated petioles; and (3) careless drying, due to the neglect on the part of the strippers in not immediately placing the fiber in the sun to dry, and in not protecting it from the rain or other forms of moisture which cause discoloration and reduce the strength of the fiber. These causes tend to produce coarse, spotted-brown fiber of uneven strength, instead of the long, soft, white fiber uniformly cleaned and having uniform strength. It is said that in former times it was customary for the authorities to burn inferior fiber to discourage its production; for they maintained that the marketing of the lower grades injured the reputation of abaca fiber, and lessened the demand for it in the world's markets by inviting competition from inferior rope fibers.

However, the local provincial buyers also have been held responsible for the production of lower grades of fiber in the Philippines. In 1903, during cleaning experiments made at Gubat, Sorsogon,¹ it was shown that during the first hour one and a half kilos of high-grade fiber valued at seventy centavos could be produced with a smooth-edged knife, and about three kilos could be cleaned with a serrated blade, the value of the latter being ninety-four centavos. At wages of half the product, therefore, the stripper obtained thirty-five centavos an hour by stripping the high-grade fiber, and forty-seven centavos an hour by stripping the lower-grade material, a

¹ *Bulletin 58*, Bureau of Labor, Washington, D. C.

difference of twelve centavos an hour. In other words, the provincial middlemen took large profits from the higher grades, and reasonable profits from the lower grades. As a result, the producer received less by the hour for labor on the higher grades than on the lower grades. This, it was said, was not the fault of the large dealers and exporters, but of the local buyers. For instance, in 1912 at Gubat, Sorsogon, good current fiber was selling at ₱25 per 100 kilos, which would have been worth ₱40 in Manila, a profit of sixty per cent to the buyer; at Tabaco, Albay, current United States fiber selling in Manila at ₱28 brought ₱20, a profit of forty per cent; and so the percentage of profit fell as the grade became lower. Inferior grades of the fiber brought only a reasonable profit.¹

With the idea of controlling the quality of hemp fiber and its production the Philippine Legislature passed Act Number 2380. The exports for 1916 and 1917 were entirely of hemp graded under this law, and the customs statistics for these years have helped to clear up the point of quality. The following table gives the details of the exports for the two years:

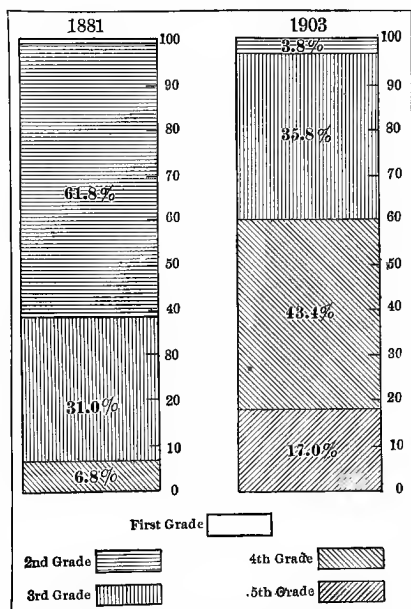


CHART V. THE PERCENTAGE OF ABACA FIBER OF EACH GRADE SHIPPED BY A SINGLE FIRM

Data from *Bulletin 58*, Bureau of Labor, Washington, D.C.

¹ From data by the Fiber Expert, Bureau of Agriculture, Manila.

GRADE	1917			1916		
	Quantity (in kilos)	Value	Average value per 1000 kilos	Quantity (in kilos)	Value	Average value per 1000 kilos
A, Extra prime	1,152,643	P1,770,216	P1,535	939,666	P907,110	P965
B, Prime	2,369,567	3,085,422	1,307	1,426,020	1,148,338	812
C, Superior current . .	5,943,069	6,330,932	1,065	2,831,906	1,828,866	645
D, Good current	7,675,611	7,044,859	917	4,402,325	2,469,628	549
E, Midway	14,996,615	11,917,408	794	10,330,419	4,980,320	482
S1, Streaky No. 1	2,003,547	1,293,279	645	2,384,680	1,026,831	430
S2, Streaky No. 2	4,868,491	2,838,663	583	2,936,454	1,185,809	403
S3, Streaky No. 3	2,593,126	1,429,240	551	1,066,529	402,679	377
F, Current	24,151,154	17,118,331	708	16,547,107	7,691,871	464
G, Seconds	5,738,246	2,591,037	451	5,773,682	2,140,773	370
H, Brown	3,355,923	1,419,070	422	3,137,714	1,122,691	357
O, Strings	522,670	126,380	241	856,542	118,071	137
T, Tow	1,863,973	281,794	151	1,478,109	163,316	110
I, Good fair	18,297,299	9,826,569	537	17,119,707	6,625,592	387
J, Fair	23,995,466	10,390,369	433	22,831,770	8,222,700	360
K, Medium	10,011,423	3,523,462	351	7,489,694	2,579,226	344
L, Coarse	19,854,724	6,383,368	321	20,750,667	6,521,409	314
M, Coarse brown	6,853,837	2,046,681	298	8,485,812	2,451,883	288
DL, Daet coarse	7,386,935	2,167,502	293	3,465,750	1,077,497	310
DM, Daet coarse brown .	3,443,999	948,030	275	1,460,950	411,838	281
OO, Strings	397,321	71,601	180	531,181	53,713	101
Y, Damaged	579,464	137,811	237	687,466	139,782	203
Hemp prepared with oil	819,977	553,242	674	242,754	109,250	450
Not graded				59,188	5,490	92
Various grades	569,124	320,293	562			
Total	169,435,204	P93,615,559	P552	137,326,092	P53,384,593	P388

A study of this table will indicate the grades that are produced in largest quantity and those that are of most value.

In general it may be stated that nearly all A and B, about one half of C, and a fractional part of D and E are sent to Japan to be made into Tagal hat braids. This fiber is long and glassy white, excellently cleaned. The strings (O) with which the hanks of fiber are tied when they reach the baling establishments, and the matted fiber or tow (T) resulting from pulling apart hanks of different grades, are also sent to Japan, where cheap labor is available to straighten them out for rope making. These grades are unimportant. Cordage fiber, grades J to C, are for the most part sent to the United States. Grades I to C are known as the "U. S. grades" or "grades of excellent or good cleaning." Some of the grades H and J,

and nearly all grades K to DM, are sent to the United Kingdom. Grades J to DM are known as the "U. K. Grades" or "partially cleaned fiber."

In other words, there are three principal markets for Manila hemp: (1) Japan for the very best or Tagal grades; (2) the United States for the higher cordage grades; and (3) the United Kingdom for the lower cordage grades. The exports to these markets in 1917 were as follows:

MARKET	GRADES	KILOS	VALUE
Japan	A, B, C, (D, E)	6,000,000	₱8,000,000
United States	C—J	95,000,000	59,000,000
United Kingdom	H, J, to DM	49,000,000	19,000,000

The market for Tagal grades has become so distinct that they are now being graded separately. The demand for higher and lower cordage grades in the United States and the United Kingdom results from the differences in machinery, and is therefore constant.

In the long run it is the competition between these two markets that determines the proportion of the higher to the lower grades of abaca fiber. If too little lower-grade fiber has been produced, these grades increase in price until the producer receives greater returns from shipping them. The lower grades are then produced until the resultant shortage in the higher grades increases the price of the grades for the United States. So the price and the production vary according to the demands of the United States and the United Kingdom. The figures of production are given in the table on page 92.

In 1915 the United Kingdom grades amounted to about forty per cent of the total abaca production, that is, "fair" to "coarse brown and Daet coarse brown." In 1916 these grades had increased to fifty-five per cent, which was an over-production. In 1917 they had decreased to forty-seven per cent, and by the beginning of 1918 there was an actual shortage in the grades for the United Kingdom. Then the

COMPARATIVE PRODUCTION OF ABACA (MANILA HEMP)
FOR 1915-1918

GRADES	1915		1916		1917		1918	
	Number of bales	Per-cent-age	Number of bales	Per-cent-age	Number of bales	Per-cent-age	Number of bales	Per-cent-age
Extra prime . . .	9,678	1.0	7,325	0.6	9,080	0.7	71	.01
Prime	17,815	1.7	11,039	0.9	20,671	1.6	552	.04
Superior current . .	34,323	3.4	20,892	1.8	50,907	3.7	8,072	.61
Good current . . .	57,161	5.6	32,490	2.8	77,605	5.8	37,248	2.82
Midway	115,600	11.4	76,333	6.5	145,361	11.0	92,560	7.01
Streaky one, S1 . .	21,385	2.1	14,460	1.2	15,914	1.2	13,497	1.02
Streaky two, S2 . .	23,271	2.3	26,651	2.3	36,998	2.8	38,052	2.88
Streaky three, S3 . .	8,976	0.9	9,623	0.8	25,491	2.0	24,233	1.84
Current	148,650	14.7	128,000	10.9	214,696	16.5	189,916	14.34
Good fair	110,132	10.9	131,499	11.2	41,673	3.3	192,429	14.56
Seconds	40,009	4.0	42,678	3.7	23,423	1.8	50,128	3.79
Fair	140,321	13.9	204,749	17.4	148,558	11.6	394,099	29.83
Brown	24,964	2.5	26,227	2.2	162,715	12.8	31,602	2.39
Medium	46,759	4.6	79,481	6.8	59,245	4.8	107,900	8.17
Coarse and Daet coarse	131,426	13.0	246,767	21.0	157,757	12.3	86,282	6.53
Coarse brown and Daet coarse brown	65,592	6.5	87,839	7.5	73,206	5.6	31,628	2.40
Strings, tow, and damage	15,324	1.5	28,620	2.4	28,461	2.5	23,210	1.76
Total	1,011,336	100.0	1,174,664	100.0	1,291,851	100.0	1,321,479 ¹	100.00

pendulum swung again, and by the end of the year there was a surplus of fiber for the United Kingdom and a shortage in the grades for the United States.

The quality of abaca fiber produced in the Philippines responds, in general, to the demands of the United States and the United Kingdom. Later we shall see whether these demands can be anticipated.

PRICE

The average price received for all grades of abaca fiber may best be discussed from a historic standpoint. Chart VI shows graphically the history of abaca exports and prices since 1877. From the heavy smoothed line it may be seen (Fig. I) that the export of abaca has steadily increased, the extremes being 37,000,000 kilos in 1877 and 175,000,000 kilos in 1912. From

¹ Not including 32,799 bales of Tagal braid.

Figure II it may be seen that in the period 1877-1895 the price rose and fell twice without great fluctuation; that in the period 1899-1911 it again rose and fell; that since 1911 it has reached its highest point.

It will be noted, also, that the drop in price from 1907 to 1911 was particularly rapid. This decrease in the price of abaca had great influence on the industry in the Philippines

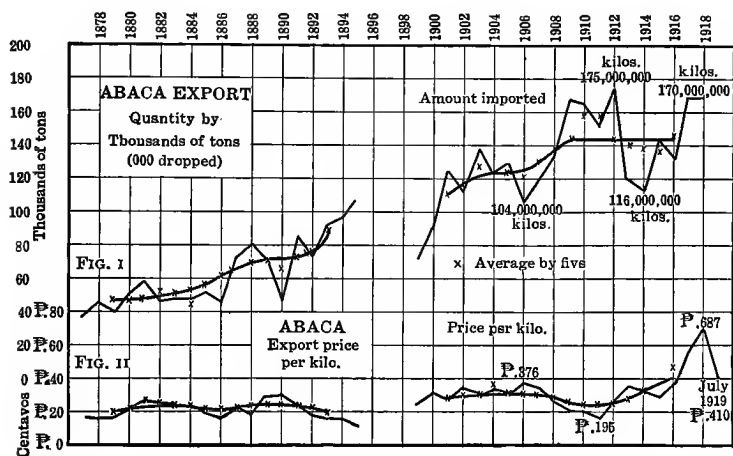


CHART VI. PHILIPPINE ABACA EXPORTS

Census and Customs Statistics

and warrants careful consideration. Such a drop may have been the result of several conditions, of which the following are probably the most important: (1) the competition of agave fibers, of which there had been a large production and which are always cheaper than abaca, with the lower grades of Manila hemp; (2) overproduction of abaca fiber combined with a general falling off in demand, the result of lessened industrial activity in Europe and America; (3) a buying monopoly either in the Philippines or in the United States and Europe, or in both.

As has been previously stated, prices obtained for the lower and the higher grades of abaca in the early years of American occupation were such as to encourage the production of lower grades. Consequently the standard of production was continually lowered through neglect of the fields, the use of serrated knives, and poor curing. The fiber thus produced was not superior to sisal, henequen, Mauritius hemp, and New Zealand hemp, and its price was consequently reduced to that of these cheaper materials.

Although not so much affected, the higher grades of abaca fiber also brought a lower price in the world's market. This

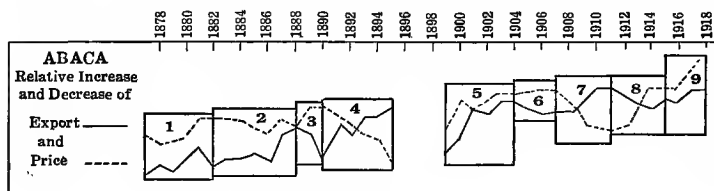


CHART VII

cannot be explained by competition, since no other fiber used in making rope equals the best abaca. Again, on Chart VI it will be noted that in the period 1906-1909 the rapid decrease in the price of abaca is coincident with a rapid increase in its export. For the purpose of comparing other periods in the history of abaca, the lines showing relative increase and decrease in export and price have been placed together in Chart VII, and periods in this history have been indicated by rectangles.¹ In rectangle 1 the broken line, which indicates the price of abaca, and the unbroken line, which represents the export of abaca, increase in about the same proportion. In rectangle 2, although there is an increase in the amount of abaca exported, there is a fall in the price. On the other hand, in rectangle 3 the decrease in the amount of abaca exported is accompanied by an increase in the price. In rectangle 4

¹ These lines are drawn to a logarithmic scale.

there is a marked rise in the amount exported, and a marked fall in price. No figures are available for war times, but it is evident that the world's markets were undersupplied. Hence in the years 1899-1904, years of great prosperity in the United States and Europe, increase in the exports of abaca are accompanied by increase in price (rectangle 5). After this period there is again (rectangle 6) a decrease in the amount of abaca exported, probably due to the drought of 1903, while prices still continue to rise. Rectangle 7 shows another great increase in exports, which are again accompanied by a marked fall in the price. From this comparison of relative increase and decrease in price and export, it would seem probable that the fall in price during the period of 1906-1911 was due, to a considerable degree, to the correspondingly large increase in the production and exports during that time. This increased production was caused by large plantings (beginning with the years 1902-1906), which in turn had been brought about by the high prices and profits prevailing at that time.

In 1907 there were panicky conditions in Europe and the United States, and industrial affairs were weak for a number of years. In 1908-1909 there was a reoccurrence of panicky conditions. At such times those industries in which much abaca is used, particularly the engineering industries, are most seriously affected. Hence it is probable that the fall in price of abaca from 1907 to 1911 resulted from overproduction and the general weak condition of industrial affairs.¹

The low prices which abaca fiber was bringing greatly reduced the amount of stripping from the old plantings. During drought the growth of abaca stops, and no petioles mature for stripping. Some plantations were almost destroyed in the drought of 1911-1912; in others it was impossible to strip fiber for several months. A decided decrease in the supply of abaca fiber resulted, as will be noted in the exports for 1913 and 1914. But in 1912 the Philippines began to feel the

¹ Such cycles occur with all commercially well-established products.

quickening pulse of industry in Europe and America in increased demand for abaca fiber. If prices had not risen, enough fiber would not have been produced to meet this demand. Even if buying firms were in agreement, they would have been compelled to raise their buying price to the producers. In the space of a few weeks prices rose to the point at which they had been in 1907, an increase of one hundred per cent and more. These facts are shown in rectangle 8.

By 1915 the effects of the drought had disappeared, and in response to high prices the stripping of abaca was everywhere resumed. In 1917 exports increased to 170,000,000 kilos, and in spite of extremely high prices in 1918 remained at that level. The maximum production from available abaca plants in 1918 was evidently, therefore, 170,000,000 kilos. The very much greater proportional increase in the price of abaca over the production of the fiber is seen in rectangle 9, an increase due to the great demand for the fiber for war needs in the Allied countries.

With the end of the war the war's demand for abaca ceased, and the large stocks of abaca fiber on hand in the United States, the disorganization of industry in Europe, and the lack of transportation resulted in another of the periodic depressions in the abaca industry. The demand for abaca fiber weakened and prices broke. In July, 1919, they had fallen more than fifty per cent, to about ₱0.40 per kilo, which was about the current price in 1916, before the war prices became effective. Another reason for the lack of demand for abaca was the failure of the government sisal monopoly in Mexico; it caused a large quantity of sisal fiber, which competes with the lower grades of Manila hemp, to be dumped on the market in the United States at a very low figure. All these conditions resulted in a serious reduction in the exports of abaca, the accumulation of the fiber in the Philippines, and a falling off in the amount of fiber stripped, especially in the regions where high wages and transportation charges left little or no margin of profit; laborers working on shares found that they could

not earn sufficient wages, and planted food crops or engaged in more remunerative industries.

As to a buying monopoly, nothing definite is known, although it has often been stated that a monopoly, controlling both the Philippine and the foreign market, exists in the abaca trade. It is obvious that such a monopoly could easily be established, since the industry is centered in the Philippines and practically in two ports, Manila and Cebu, and almost the whole product is sent to London and New York. Moreover, the bulk of the product goes to only a few manufacturers of rope. It is known that stagnation in the domestic hemp market results from the failure of these concerns to buy (usually because they are stocked up). The competition between the United States and the United Kingdom would tend to prevent a buying monopoly.

PROBLEMS TO BE SOLVED

The problems of the abaca industry are as follows:

1. *To maintain the grade of Manila hemp.* It is doubtful whether the Daet grades can be used to advantage for cordage purposes, except perhaps as a mixture with the higher grades. There can be no doubt that the production of this type of fiber has hurt the reputation of our abaca, and for this and local economic reasons its production should be discouraged. During March and April of 1915 a worse type of stringy product appeared on the local market, coming from the Buhi district of South Camarines. The chief of the fiber division of the Bureau of Agriculture immediately instructed all fiber inspectors in southern Luzon not to grade it under any standard, even under the Daet type. This prompt action resulted in its disappearance from the market in less than two months after its detection.

2. *To meet the market demands for the United States and the United Kingdom.* This can be done if the Bureau of Agriculture interprets the statistics of production and export, and

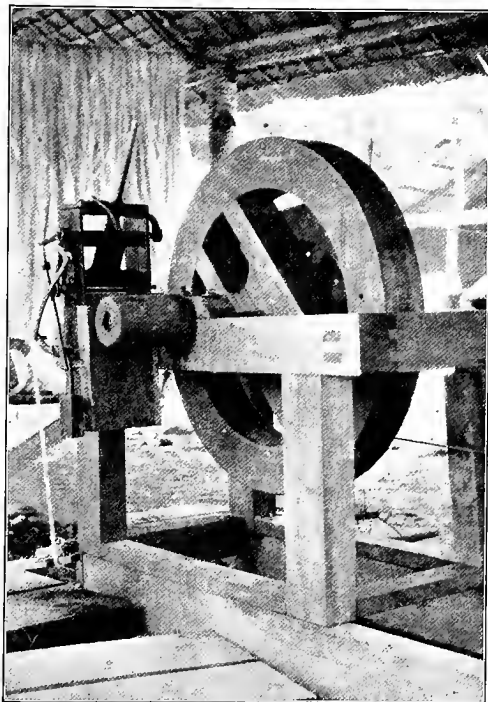
anticipates the relative demands for higher and lower grades. Such action will prevent the overproduction of any grades, and insure the production of grades that will be in demand by the time they reach the export markets. The Bureau is in a position to advise growers and strippers, through its force of inspectors. The production of different qualities of hemp is easily adjusted by varying the kind of knife used and the pressure exerted on it. The greater the pressure, the higher is the grade of fiber produced. With a given pressure a smooth-edged knife will produce the highest-grade fiber; a knife with thirty serrations to the inch, almost the same grade; a knife with fifteen serrations to the inch, L grade; a knife with twelve serrations to the inch, DL grade. Hence it is comparatively easy for a stripper to lower or raise the grade and quality of his product, if he is once convinced that demand and price will make it remunerative for him to do so. The production of different grades can also be regulated through the larger owners and the graders, balers, and merchants, who can adjust prices to stimulate the production of the grades desired and store fiber against probable change in the market.

3. *To protect the small producer from the middlemen.* This is being done by displaying samples of the different grades in public places as well as in establishments for grading and baling, and by furnishing current market prices to be posted by public officials. Before the government grading went into effect, the different hemp buyers had different standards of grades and different nomenclatures for them; the small producer could not tell which merchant would give him the highest price for his fiber. Now the gradings are standardized and published, and the small producer is in a position to know approximately what the grade of his fiber should be, and the price he should receive for it.

4. *To equalize the demand for abaca.* The history of abaca is one of great fluctuations in price, demand, output, and export. If the government could advise planters concerning the probable general demands of the United Kingdom and the

United States, and if it could maintain a system of warehouses in which the fiber could be stored when the market is dull, it might stabilize the industry and permit the continuous stripping of the fiber to be carried on at a reasonable price.

5. *To secure machinery for stripping.* In the periods when abaca fiber brings a high price, not enough laborers can be secured to strip it. In the periods when the fiber brings a low price, the laborers either refuse to work for the small wages received, or insist on having a larger part of the product. The invention of satisfactory stripping machines would solve the labor problem. Such machines as these have long been in use in the production of the



A SIMPLE MECHANICAL ABACA STRIPPER

sisal fiber. In the last fifteen years numerous abaca-stripping machines have been invented and experimented with in the Philippines. As yet, however, none of them have been successful enough to be generally adopted; they do not turn out a good grade of fiber, or do not turn it out rapidly enough; or they are so large that they require a great deal of power to run them, and are so heavy that they cannot be

transported, which causes the additional expense of carrying the petioles to a central point. In hilly or broken country, or in regions of small, scattered plantations, only the smallest machinery would be practicable. Successful stripping machines of large capacity might ultimately cause overproduction and lower the price; they would shut out small producers, and encourage large plantations, a result not desirable from the point of view of political economy.

FUTURE OF THE INDUSTRY

It has been stated that a decrease in the price of abaca greatly affects the industry. From Chart VI it will be seen that the general export price fell from 37.6 centavos in 1907 to 19.5 centavos in 1911, a drop of almost fifty per cent, which especially affected the lower grades. As a result, production was greatly curtailed in regions such as Albay, where the lower grades of fiber are produced, and in the interior of Samar and in the Bukidnon country, where the cost of transportation to the coast is an important factor. In the lowland regions producing a high-grade fiber, such as the lowlands of Samar, Leyte, and Davao, the drop was not felt so keenly. In many localities in which abaca could no longer be produced at a profit, the fields were allowed to grow up in jungle. In some places abaca was grubbed up, and the land planted with coconuts. If the rise in price of abaca had not given it a new lease of life, the industry would undoubtedly have died out in districts producing a low-grade fiber.

As it happened, the rise in price which occurred in 1912 encouraged owners to renew their activity. In many places, however, they were unable, because of the lack of labor, to take advantage of the higher prices. As has been stated, strippers were dependent on abaca fiber for their living. They grew no food crops about their houses; consequently, when the price of the fiber dropped below the point at which they were warranted in obtaining it, these men left the latés and sought



HAND STRIPPING

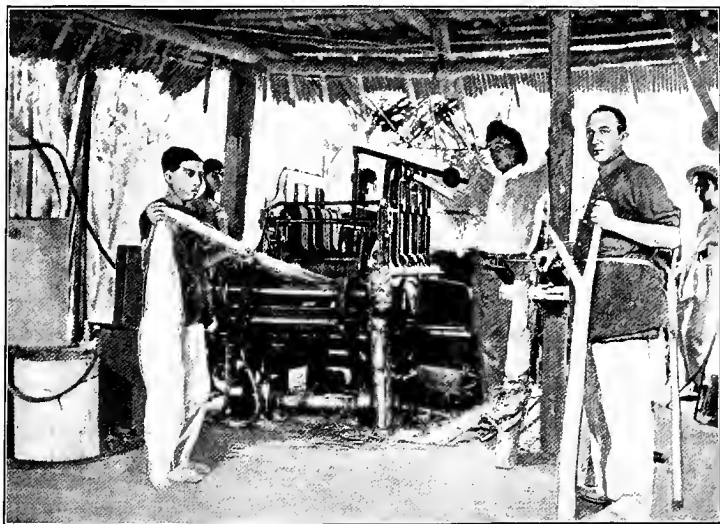


Photo by Bureau of Agriculture

A STRIPPING MACHINE

STRIPPING ABACA

work in other agricultural occupations, especially in the cultivation of rice. Sometimes they remained in the same locality, but just as often they went to other places. Thus, when their services were again needed, many of them were no longer available.

The increase in price and demand for abaca during the World War accentuated the shortage of labor and caused a demand for strippers and helpers which resulted in a substantial increase in wages, and, in some districts, the importation of labor.

The world's consumption of Manila hemp in 1918 was about 1,000,000 bales. This was abnormal, and was due to the war. In 1919 approximately 800,000 bales were consumed, or 200,000 bales fewer than in 1918. This reduction in consumption caused the stock in the Islands to accumulate. However, typhoons and drought in 1918-1919 did considerable damage to existing plantations. The combination of events brought about the immediate curtailment of production, which will undoubtedly be felt for a few years. It was estimated that the production of abaca in 1919 would be twenty-five per cent less than in 1918. It was probable, therefore, that a decrease in the production of hemp, such as is indicated on Chart VII for the years 1903-1906, 1909-1911, and 1912-1914, would again occur. Such decreases were brought about by similar conditions, that is, by overproduction of fiber, which resulted in a temporary lack of demand, a consequent fall of price, and discouragement to producers and strippers, and by climatic conditions which wrought destruction in the hemp fields.

The prices of hemp in the middle of 1919 were higher than those for 1912-1916; nevertheless, they were not profitable to the planters and strippers because the cost of production was so much greater than in the period before the war. Indeed, it will be impossible for the price of hemp to return to its former level; a higher level of prices has been established by the higher cost of production. This new level will not be constant. Prices in the middle of the year 1919 probably

indicated the lowest point. As soon as industrial conditions in Europe and America adjust themselves, there will be a period of industrial revival, and with it a heavy demand for Manila hemp. This will cause fluctuations in prices, such as have occurred throughout the history of the fiber.

The prices of abaca fiber will always be governed by the world's demand and the local supply, and will rise and fall with the impulse of industry in Europe and America, and with local conditions of weather and of labor. With high prices even the careless owner and producer of inferior fiber will make money. With a low market he will be forced out of producing, while the careful, systematic planter and producer of higher grades will still find abaca a profitable crop.

The high prices of 1918 did not accrue to the producers of abaca alone. Wages of hemp strippers increased from fifty to more than one hundred per cent. The cost of carrying hemp from Legaspi to Manila rose in the same proportions. Every item for maintaining the plantations was increased. The value of the hemp exported in 1918 was ₱116,000,000. In 1914 the same amount of hemp would have brought only ₱33,000,000. The difference, ₱83,000,000, was distributed among the persons and factors that had to do with the production. A considerable part of this increased cost of production is permanent, and a higher level of price for abaca fiber may therefore be expected.

NEW USES OF ABACA

Up to the last few years nearly all the abaca exported from the Philippines has been used in manufacturing rope, for which purpose the best fiber has no substitute. Since historic times the Filipinos have woven from abaca fiber a cloth known as sinamay, although it is probable that the amount so used in the Philippines has never been more than ten per cent of the total production. Within the last few years, however, other uses have been found for the fiber. The knotted yarn

used in the production of sinamay has been exported in increasing quantities to be made into hat braids and coarse material for stiffening clothes. In the year 1918 the value of this export amounted to more than ₱1,500,000.

The highest grades of fiber, grades AA to EE, are shipped to Japan to be knotted and reexported as hat braid to the United States. In 1918 the export of this hemp to Japan was worth ₱6,000,000; in 1917 it was worth ₱8,000,000 (grades A, B, C, and D-E).

For many years a strong wrapping paper has been manufactured from old rope. When the price of paper is high, the waste from abaca stripping has been exported for this purpose; with the low price of the fiber there was established, in one province, a factory which prepared and dried the whole petiole for shipment to the United States, where it was made into paper.

Recently lupis (strips of the fiber with the pulp attached) has received a considerable amount of attention in local handicraft work.

It is probable that these new uses for abaca fiber are but the beginnings. Its strength and its resistance to water commend it for use in objects of art as much as for rope making; the beautiful hues to which it can be dyed, and its luster, make it an excellent material for such purposes.

SUGGESTIONS FOR REVIEW AND ORIGINAL WORK

SUGGESTIONS BASED ON THE TEXT

1. The stripping of abaca, including a description of the preparation of the strips for the knife, of the knife and lever, of smooth and serrated knives, and of curing and baling.
2. Why labor is the chief factor in the production of abaca.
3. Judging from the respective shares of the laborers, compare the labor value of rice and abaca fiber.
4. Could the abaca laborer be made less dependent on the production of the fiber and the price of abaca?
5. Would it be economically of advantage to him and to the community?

6. What must be the characteristics of a successful abaca-stripping machine? 7. What would the effect of a successful stripping machinery be on (a) the small plots of abaca; (b) on the status of the laborer in abaca; (c) on the planting and production of abaca; (d) on the price of abaca fiber?

8. What determines the average quality of abaca? 9. In the long run, what determines the average price of Manila hemp? 10. What determines the price at any given time? Explain your statements by referring to Charts VI and VII.

11. If you had a sum of money to invest, would you invest it in an abaca plantation? Why?

12. Make a chart showing the value of exports of Manila hemp since 1899. 13. Point out the periods of large exports and high prices, large exports and low prices, small exports and high prices. Explain the conditions that brought them about.

14. Why is it that after destructive typhoons in abaca regions, causing the blowing down of stalks, an unusual percentage of grades for the United Kingdom is produced?

SUGGESTIONS FOR THE STUDY OF LOCAL CONDITIONS IN ABACA REGIONS

1. How abaca fiber is brought from outlying districts to grading centers. 2. How local conditions agree with and differ from those described in the text.

SUGGESTIONS FOR REPORTS FROM REFERENCES, ESPECIALLY FROM COMMERCIAL GEOGRAPHIES

1. From the latest "Statistics on Principal Crops of the Philippine Islands" prepare a chart representing the amount of abaca production in the Philippines. 2. Divide it into sections representing the production of the chief producing provinces. 3. Compare these. 4. Using these data and referring to Miller's "Commercial Geography" and Miller and Polley's "Intermediate Geography," prepare a map of the Philippines showing the abaca-producing regions. 5. Explain the conditions of soil and weather that make abaca production possible in each.

6. Secure the necessary data from the latest annual report of the Collector of Customs, and bring Chart VI down to the present. Comment on these new figures.

7. From the *Philippine Agriculture Review*, Vol. XI, No. 3:

In the abaca districts, (*a*) a description of the standard grades of Manila hemp; (*b*) the grading, baling, and inspection of abaca fiber.

In the maguey districts, (*a*) a description of the standard grades of maguey and sisal; (*b*) the grading, baling, and inspection of maguey fiber.

8. A comparison between the cultivation, marketing, and manufacturing of abaca in the Philippines and cotton in the United States. (Brigham, pages 22-39.)

9. Some attempts to solve the abaca-stripping problem; their results.

10. The structural and economic classification of fiber. 11. How various fibers are obtained. 12. Machines that have been adapted to the processes. (Miller.)

13. The cordage fibers of the world. 14. Flax, where grown and used (illustrated with map). 15. The relation of flax and other cordage fibers to abaca. (Miller; Finch and Baker.)

SELECTIONS ON THE THEORY OF ECONOMICS TO BE APPLIED TO THE MATERIAL IN THE CHAPTER

1. Market and normal values. (Bullock, pages 98-115.)

2. Explain the difference between economics and political economy.

CHAPTER VI

COPRA AND COCONUT OIL AS EXPORT CROPS

HISTORICAL

Before the arrival of Europeans in the Orient the coconut palm was a most important plant; the meat, oil, sap, fiber, and other parts and products of the tree were already being utilized. It is evident that coconuts were a large crop in Ceylon long before the days of the Portuguese, for on their arrival they noted that the southeast coast of the island was a vast coconut grove. The Dutch gave great impetus to the coconut industry in their Eastern colonies by encouraging the production and export of coir fiber.¹

As late as the first quarter of the nineteenth century Europe knew little of the value and uses of coconut products. About that time a certain captain of Aberdeen took home a cargo of oil, but had considerable difficulty in disposing of it. It was finally bought by a woolen mill and utilized as lubricating oil.

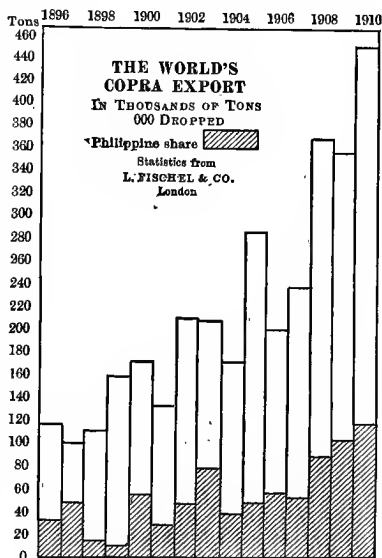


CHART VIII

¹ J. Ferguson's "Coconut Planters' Manual."

The recognition of the properties of coconut oil, which has placed it among the oils most highly valued for human consumption, did not come about until the latter part of the nineteenth century. For manufacturing purposes coconut oil was first utilized in large quantities for high-grade soaps and candles. Because of the advancing price of animal fats (butter and lard) there has been a growing tendency to substitute products from vegetable oils. Cottonseed and peanut oil are used to a large extent, but coconut oil, because of all oils

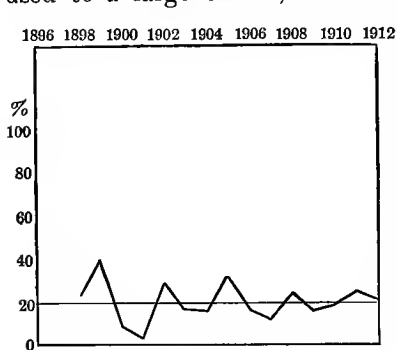


CHART IX. PERCENTAGE OF THE
WORLD'S COPRA SHIPMENTS FROM
THE PHILIPPINES

Statistics from L. Fischel & Co., London

it most closely resembles butter in its composition, and because it has a high melting point, is the most suitable for the purpose. Various persons and countries claim the credit for beginning the manufacture of imitation butter and lard from coconut oil. Before the World War the most important producers and consumers were Germany, France, and England. In Germany millions of pesos

were invested in the industry. Not only was the consumption of this product increasing in these countries, but its manufacture and its use were spreading in other parts of Europe and in America. Meanwhile increased amounts of oil had been utilized in making soap and candles, the large consumption of whole nuts had continued, and the production of desiccated coconut had increased. The adjustment of demand and supply in the product of a long-time crop like copra covers a long period. New plantings of coconut palms produce full yields only after seven years of growth. Thus the output of copra had not kept pace with the increased demand, and until 1914 prices had continued to rise. (See Chart XII.)

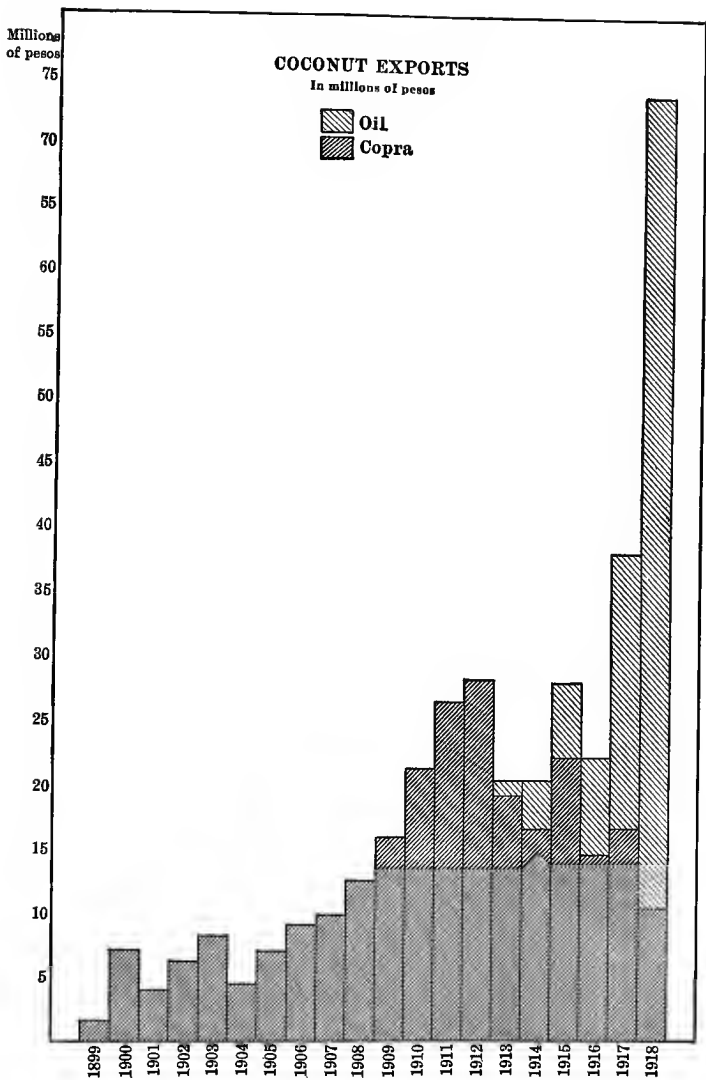


CHART X. PHILIPPINE COCONUT EXPORTS IN MILLIONS OF PESOS

Customs Statistics

PHILIPPINE PRE-WAR PRODUCTION

The production of coconuts before the World War is discussed in terms of copra, since it was this dried meat of the nut that was exported to the oil-consuming countries. The Philippines then exported more copra than any other country. Chart VIII shows graphically the gradual increase of the world's copra export and the portion of it which came from the Philippines. Chart IX shows that on the average the Islands had usually been credited with about one fourth of the world's output. The exports from Java had advanced relatively more and from Singapore relatively less than from the Philippines. In general, therefore, it may be stated that the Philippines were keeping their position as the chief exporter of copra.

Statistics given thus far have dealt only with the amount of copra; but if the value of this export is considered, its importance is even greater. This is shown in Chart X. Chart XI shows the varying degrees in which sugar, abaca, tobacco, and copra have entered the export trade of the Philippines. Although in 1899 copra was the least important of the four staple Philippine export crops, in 1911 it approached abaca in value.¹ This advance came about not only through greatly increased amounts of copra exported, but through its advancing price, which in the period under discussion increased about one hundred per cent (see Chart XII).

PHILIPPINE POST-WAR PRODUCTION

After the drought of 1912 (see Chart XIII) the amount of copra exported from the Philippines fell off about forty-five per cent, and before the trees recovered and production became normal, the World War began. The Islands had been sending

¹ Figures for abaca do not include knotted abaca. Since eight ninths of the cost of knotted abaca is due to the labor of tying it, the relative positions of abaca exports and copra exports would be little changed by adding the value of fiber only.

their copra to Europe, mostly to France. As shipping became scarcer, the copra began piling up in the warehouses of Manila and Cebu. The demand for copra in Europe had even increased, but it was possible to ship only a part of our product to the market. As local stocks increased, the price decreased (Chart XII). Finally two outlets for our copra were found, the one (1) directly, the other (2) indirectly, into the United States:

1. In 1912 the United States imported about 21,000,000 tons of copra from the Philippines, which was about fifteen per cent of our total export of copra; in 1917 it imported 68,000,000 tons, which was more than seventy per cent of our copra exports; and in 1918 it imported our entire copra exports of more than 55,000,000 tons. The destination of Philippine copra was now changed from Europe to America.

2. Just before the World War coconut-oil factories were established in the Philippines to supply the domestic market and to export oil to China. The oil expressed from a ton of copra takes up only a small part of the space that the copra fills. While ships were too scarce and freights too high for copra, it was possible to ship the oil. Tanks and casks were made available, and more machinery was imported, with the result that while copra exports diminished, oil exports increased. In 1912 the coconut oil exported was worth only ₱80 and the copra more than ₱28,000,000; in 1918 the coconut oil exported was worth ₱63,300,000 and the copra ₱10,300,000. Practically all the oil was shipped to the United States.

In other words, the coconut industry in the Philippines was saved from ruin for the period of the war by developing the United States market for both copra and oil. The unusually favorable results for the Islands can be seen in Chart X. In 1918 the value of our coconut exports was again greater than that of any other product except hemp.

INCREASE IN YIELD

Although the coconut industry is a most flourishing one in the Philippines, certain conditions which are liable to affect it adversely should be understood. Mr. O. W. Barrett, formerly of the Bureau of Agriculture, estimated that the coconut production in the Philippines could be increased one fourth without increasing the area of production, if only the proper methods of cultivation should be followed.¹

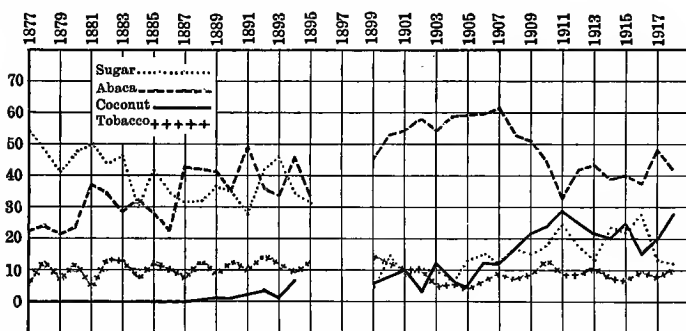


CHART XI. FOUR PRINCIPAL EXPORTS OF THE PHILIPPINE ISLANDS

Percentage of value of total exports

Two kinds of plantings are found, groves owned by large landholders or combinations of landholders, and patches about the homes of small farmers. The questions of selecting seed and of giving ample space between rows and between plants in the row are of as great importance as in the production of corn, and have received as little attention from coconut planters. The growth of weeds, grass, and underbrush in coconut groves greatly reduces production, and with the rubbish, dead leaves, and dead tree trunks, helps to provide breeding places for coconut pests. In important coconut

¹ See *Farmers' Bulletin No. 17*, Bureau of Agriculture, and the *Philippine Agricultural Review*.

regions there are groves which are kept clean either to prevent insects from breeding, or to make it easy to find the coconuts. In most places, however, both large and small groves remain uncleared.

The amount of copra produced in the Philippines is greatly lessened by pests, storms, and drought. The most destructive of the coconut pests are insects, mammals, birds, and diseases.¹ Of the insects the beetles are by far the most harmful, particularly the uang, or rhinoceros beetle,² which attacks

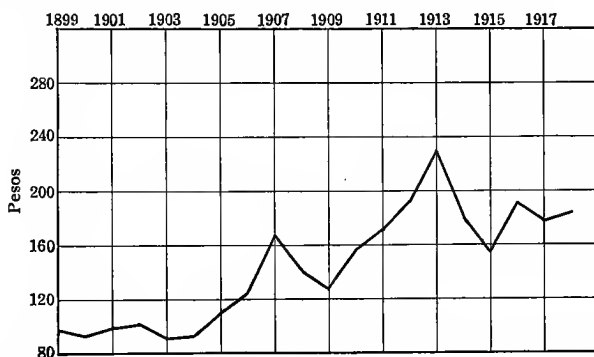


CHART XII. PHILIPPINE COPRA EXPORT; PRICE PER METRIC TON
Customs Statistics

the bud of the palm. This pest has gone throughout the Philippines, and in other Oriental coconut groves has caused damage amounting to millions of pesos. Another harmful beetle is the red weevil,³ which bores into the trunk of the palm. Zamboanga, Laguna, and Oriental Negros are known to be infected by it, but no serious outbreaks have recently occurred.

The rhinoceros beetle breeds in rubbish formed by old leaves, husks, and the like, and in old trunks and stumps of

¹ *Philippine Agricultural Review*, Vol. V, No. 5.

² *Oryctes rhinoceros*.

³ *Rhynchophorus ferrugineus*.

palms. The red weevil enters the trunk of the palm through wounds and lays its eggs. The grubs bore cavities and finally destroy the tree. The prevention of these weevils rather than their slaughter is the only possible remedy, and this must be effected by the elimination of all rubbish and dead palm trunks and stumps within and near the plantations, and by the burning of all trees seriously injured by the red weevil. Thus cleanliness is one of the first rules of coconut cultivation. In certain regions where cleanliness is not observed, loss to the coconut crop may amount to fifty per cent. At Jiménez, Misamis, a whole coconut grove was destroyed by the rhinoceros beetle. Several other beetles and weevils attack Philippine coconut groves, and there are scales which do more or less damage and often kill young trees ; but the destructiveness of these in comparison with the two insects first mentioned is slight.

In the Philippines to-day there are, in all, at least eighteen insect coconut pests, six of which are important and two of which are dangerous. In comparison with that of other countries, however, our loss from such pests is small ; if care be taken, these insects can easily be controlled.

Certain animals and birds also prove harmful. Fruit bats, monkeys, and crows eat the young fruit of the coconut palm. In sparsely settled communities the wild pig is a menace to young plantations, since it roots up and devours the seedlings, and can be kept away only by means of strong fences. The wild pig is especially harmful in the Moro country, where in a single night hundreds of trees may be destroyed in one grove, if a hog-proof fence has not been built round it.

Bud rot is the most serious of all fungous or bacterial diseases attacking the palm. This disease is known in all coconut regions. In certain countries, such as Cuba, it is a menace. The Philippines have suffered one bad outbreak in the last decade. No cure is known for this disease, and palms attacked by it should be immediately cut down and burned, or buried with lime.

The law empowers the Bureau of Agriculture to issue regulations for the control of plant pests. Thus far it has been necessary to take drastic measures against bud rot only. Systematic inspections are made, and owners are compelled to destroy the infected trees.

Extraordinary droughts are injurious to coconuts. The effects of the drought of 1912 are seen in the reduced exports for 1913 and 1914 (Chart VIII). In certain regions typhoons also are very destructive, particularly in the belt in which Capiz Province and Samar are situated. The high winds blow the nuts from the trees and so strain the roots of the trees that the production is lessened. In 1908 a particularly severe typhoon passed over the region just mentioned. It was estimated that the production of copra on the island of Romblon for the year 1909 was only fifteen per cent of the normal; for 1910, about twenty-five per cent; for 1911, about forty per cent; and for 1912, about sixty per cent.¹ The falling off was due to the effect of the typhoon, a recovery from which was estimated to require five years. Similar reports came from Samar and Capiz.

INCREASE IN QUALITY

The loss from poor planting, poor cultivation, pests, and drought is considerable in the Philippines, but the loss from poor harvesting and poor drying is the largest of all. The percentage of green meat in Philippine copra is very large. Green nuts are plucked for several reasons. In many districts loss by thieves is great, and owners prefer to be sure of the green nuts rather than run the risk of losing the ripe fruit. Constant need of ready money causes the small owners to pick the green nuts and cure them for immediate sale, instead of waiting for larger returns from the mature fruit. The nuts in the cluster do not ripen together. In the system of cutting nuts from the palm, however, the tendency is to

¹ Report of R. R. Barron.

harvest all at one time. Coconuts should not be picked, cut, or thrown down from the trees. When they are ripe, they fall of their own weight, and should not be gathered until then. The highest-priced copra in the market to-day comes from the Malabar coast of India. In that region only nuts which have fallen to the ground are gathered, and these are still allowed to ripen, on platforms, for a month or more before being opened.

Perhaps one third of the copra produced in the Philippines is sundried (Cebu copra); the rest is cured by the smoking

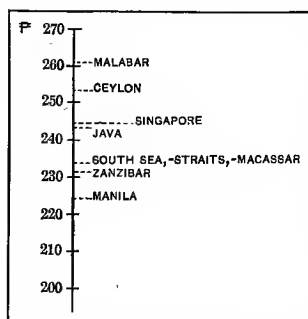


CHART XIII. PRICE OF COPRA
IN PESOS PER TON IN LONDON
DECEMBER 21, 1911

Statistics from L. Fischel & Co.

process known locally as the tapahan. Both these methods are used in many parts of the world. Sundrying gives a better product, which can be used in the manufacture of foods. Smoked copra, on account of the presence of creosote, brings a lower price. Since expensive refining methods would be necessary to make it suitable for food products, it is used principally for soaps, candles, and the like. On account of the careless methods employed both the sundried and the smoked

copra get covered with dirt while being cured, and both contain such a high percentage of water that much of the oil is lost through the growth of molds. A better grade of sundried copra would be obtained if it were cured on platforms raised above dust and dirt. A better grade of tapahan would result if zinc sheets were placed under the copra while the fresh fuel (husk and shell) is smoking, until a good body of coals has formed. Creosote would thus be eliminated, but scorching, which is one fault of the system, would not be overcome. Ordinary Philippine copra contains from ten to fifteen per cent of water when put aboard ship. Copra, not to deteriorate, must not contain more than five per cent of water, and can



A MODEL STEAM DRIER

Photo by Bureau of Agriculture



A PHILIPPINE SMOKY OPEN KILN
CURING COPRA

be produced in commercial driers only, in which the moisture is evaporated by hot air or perhaps by steam. Such machines are used in parts of the Philippines, such as Laguna and Tayabas, but are not yet entirely successful.

At the present time Philippine copra is among the lowest-priced copras in the world's market. The prices it has brought,

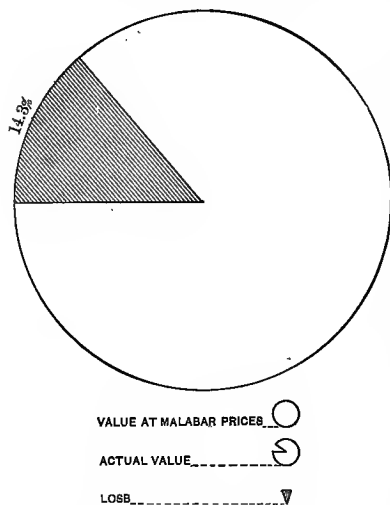


CHART XIV. VALUE OF PHILIPPINE
COPRA EXPORTS, 1911

Data from L. Fischel & Co., London

in comparison with those of other large producing countries, can be seen on Chart XIII. As long as the present great demand for copra exists, there will be a good profit in the production of the inferior product now exported from the Philippines, although to-day more than fourteen per cent of the possible value of Philippine copra is lost by poor curing (see Chart XIV). But when the market is satisfied, prices will decline, and the lower grades will be more affected, just as the lower grades of Manila hemp bring proportionally lower

prices when there is a general decline of that staple.

The problem, therefore, is not only to increase the value of the present copra export of the Philippines by producing a clean white copra of low-water content (instead of a product which easily molds), but to anticipate the production of a higher grade of copra in other countries, which will force down the price of a low-grade Philippine product. Such an increase in quality will result from the use of mature nuts and the introduction of artificial driers. The use of ripe nuts

may be brought about through the education of the coconut growers, or through government regulation.¹ Large driers will be procured most readily by the owners of large plantations, although they can be erected coöperatively by smaller growers or by private individuals to whom local growers sell their coconuts.

Such discussion does not take into account any improvement in the present methods of curing. In many districts the system of buying copra offers no inducement to the maker to produce a better quality, since all grades sell at the same price. Moreover, the continued advances of money compel the small producers to sell their product to certain dealers. This results in a lack both of competition and of incentive to produce the best copra. Changed conditions may produce copra of a higher grade.

DOMESTIC CONSUMPTION

The output of copra in the Philippines depends in no small measure on the production of tuba. The owners of Visayan groves, particularly those in localities not connected with the market by reasonably cheap transportation, often find it more profitable to produce tuba for local consumption than to grow copra for export. To a considerable extent this condition is regulated by the price of copra; for when the price rises, the tendency is to allow flower stalks to yield nuts rather than sap.

The local use of the coconuts themselves is rather large. In several localities (for instance, in Ilocos Sur and parts of

¹ On the island of Cagayan de Sulu an American trader and planter entered into an agreement with the Chinese traders for the purpose of encouraging the production of better-grade copra. By this agreement the producers had to chop up their copra in the presence of the buyer. If it were shown to be inefficiently cured, made of immature nuts, or smoked, it was not bought. If a Chinaman violated the agreement, he paid a forfeit. As a result, the producers used only matured nuts, and turned out a good grade of sundried copra, whereas on the neighboring islands the lowest grade of smoked copra was brought to market (from the report on the Sulu district, by H. C. Stanton).

Union Province) the whole crop of nuts is, as a rule, used locally or exported to other provinces for culinary purposes. Coconut oil is the fat which enters to the greatest extent into the diet of the Filipinos; it is also employed locally for many other purposes. The value of oil in proportion to its bulk is much greater than that of copra, and oil is often produced in regions remote from a copra market, since the cost of transporting it is proportionally less than the cost of transporting copra. In a few localities from which transportation is dear the product of the coconut palm is reduced to alcohol by distilling the tuba. As such regions are tapped by systems of roads and railroads, the local production of oil and alcohol decreases, and copra is made instead. From 1910 to 1917 the amount of native oil produced declined from 7,000,000 liters to 2,600,000 liters, the decline being due to the extension of roads and railroads in southern Luzon and the general high price of copra.

The large plantings of new coconut groves are taking hundreds of thousands of nuts which would otherwise be made into copra, and the crop of a few regions in the neighborhood of districts where extensive new plantings are being made is sold almost entirely for seed.

FUTURE OF THE INDUSTRY

In looking to the future of coconut oil we must first consider the possibility of competition. At the present time coconut oil is probably more used than any other. Increased demand has greatly increased the price, and consumers will naturally look for cheaper oils to take its place. Of these there are at present only two: the palm oil of Africa, which is not suitable for edible purposes; and the soya-bean oil of China and Japan, which, though cheap and good, is not so suitable for artificial butters and lards as coconut oil. We are therefore safe in stating that at the present time no vegetable oil is known which can compete with coconut oil. The

production of synthetic oil is so improbable as hardly to merit consideration. The whole question of the future of the coconut industry can therefore be limited to a discussion of copra and oil. Chart XII shows the increase in the price of Philippine copra since 1899. Whether the high price now obtained for copra will continue depends on two things: the demand in Europe and America for products of coconut oil; the production of coconuts. If the two keep pace, the price will continue at its present high point. If the demand increases in greater proportion than the crop of nuts, the price will rise still higher. If the output increases faster than the demand, the price will fall. According to the present uses of coconut oil, and the wider appreciation of its products, the demand will greatly increase within the next few years, especially in Europe; the price will probably rise in the immediate future. On the other hand, millions of new palms have been planted in the tropics, and soon there will be a great increase in the amount of copra produced, which will probably bring the price down again.

But even with greatly increased production it is probable that for many years to come copra will be one of the most profitable crops of the Philippines. New plantations set out several years ago by farsighted individuals are now beginning to bear. Each year finds a larger planting of new palms, and interest in the industry is increasing constantly. With better means of transportation new areas suitable to the coconut are being made available. At the present time only a fraction of the coconut lands in the Philippines are utilized. Mindanao contains thousands of hectares of such land. The Bondoc Peninsula may become as great a coconut grove as the region of Tayabas round Mount Banahao. Palawan, the highlands of Cavite and Laguna, Sorsogon, Mindoro, Panay, the Sulu Archipelago, and numerous smaller areas offer opportunities for coconut planting. Better methods of cultivating the tree and of making copra are constantly being used throughout the Islands. Groves in Tayabas which were

formerly littered with rubbish and overgrown with underbrush now present clean, straight rows of palms. Here and there is observed the tendency to use ripe nuts rather than to cut nuts from the tree. Artificial driers are now being introduced. In many coconut districts there seems to be a desire to learn better methods.

COPRA OR OIL

Several million pesos are invested in coconut oil mills in the Philippines. In October, 1918, there were eighteen mills in the Philippines equipped to produce nearly a thousand tons of oil a day. However, they were producing only about half that amount, for the number of expellers had so increased that the domestic supply of copra did not provide material enough to keep them in operation. In 1918 the Philippines imported copra from Singapore.¹ The country has become an exporter of oil instead of an exporter of copra.

In general, it is much more desirable for a country to export a product in a manufactured or semimanufactured state than in the raw state. The exportation of oil is more valuable to the Islands than the exportation of copra; but unless legislative restrictions are imposed, the continuance of our exportation of coconut oil will depend on competitive conditions, that is, on competition for copra between the mills of Europe, America, and the Philippines. The oil mills of Europe and America will naturally attempt to secure copra from the Philippines, and will offer as high a price as the oil market will allow. The Philippine mills will have to meet this price. Can they do it? The answer largely depends on (1) the conditions of transportation, (2) copra cake, (3) the markets for Philippine coconut oil, and (4) the conditions of labor and power in the Philippines. The situation may be expressed as follows, in terms of conditions favorable and unfavorable to the production of coconut oil in the Philippines:

¹ In the first six months of 1919 the Philippines exported copra to the value of ₱555,386; the imports amounted to more than ₱3,500,000.

UNFAVORABLE

Loss of oil in barrels, or cost of maintaining tank steamers and tank terminals.

Loss in value of copra cake.

Cost of power.

FAVORABLE

Loss of oil in transit through decomposition of copra.

Oil taking less space than copra in proportion to its value.

Labor.

Copra cake is a valuable by-product of the mills in Europe and America, and offsets the freight on the copra. To Philippine mills it has been of so little value that nearly all of it has been burned for fuel.

The question of freight rates is the determining factor. The lower the rates, the less advantage oil has over copra.

There is a chance of disaster to the oil industry in the Philippines when freights fall. The small and the poorly managed mills may be forced out of production. The larger and the better-managed mills will have a better chance, especially in the domestic market, in China, and on the Pacific Coast of the United States. Ships traveling from San Francisco to the Orient burn crude oil. When they reach Manila, part of their fuel tanks are empty, and can be filled with coconut oil for the return trip. Tank steamers that bring petroleum to the Orient may take back cargoes of coconut oil.

Moreover, as world conditions become adjusted, Philippine oil mills must face competitive conditions so far as labor and power are concerned. In 1919 the situation with regard to power was so acute that mills were obliged to reduce their hours of running, especially in Manila, where most mills are dependent on electricity.

The future of the oil industry in the Philippines will therefore depend largely on the equipment and management of the mills, their facilities for loading oil on steamers in Manila, and the facilities provided by or for them to unload and store oil in the ports of Europe and America.

But the future of the coconut regions of the Islands is bright in any case, for prices of coconuts will be high, whether the export takes the form of copra or of oil.

SUGGESTIONS FOR REVIEW AND ORIGINAL WORK

SUGGESTIONS BASED ON THE TEXT

1. Problems of the coconut industry in the Philippines. 2. If you had a favorable opportunity to buy a coconut grove that would come into bearing three years from now, would you purchase it?

3. Why does an increase in the price of copra not result in a large immediate increase in the production of copra? 4. Is this true of rice? Why? 5. Nevertheless, an immediate increase in the production of copra can be effected by reducing the production of other coconut products. What products are these? 6. Causes for the general increased demand for copra.

7. What is the comparative quality of Philippine copra? 8. How may it be improved?

9. Why were war conditions favorable to the establishment of coconut-oil factories in the Philippines? 10. You are offered the opportunity of investing in a new coconut-oil factory to be established in Manila. You are looking for an investment. Will you invest in the oil factory? Why?

11. The relative importance of the four great export crops of the Philippines (based on Chart XI). 12. From Chart XI compare the early histories of the hemp and coconut industries.

SUGGESTIONS FOR THE STUDY OF LOCAL CONDITIONS

1. How the General Order 38 of the Bureau of Agriculture, concerning bud rot, is made effective. 2. The relation of this order to Act 1757.

3. How copra is made. 4. Oil presses. 5. Uses for coconuts. 6. Uses for coconut oil.

SUGGESTIONS FOR REPORTS FROM REFERENCES, ESPECIALLY FROM COMMERCIAL GEOGRAPHIES

1. From the latest "Statistics on Principal Crops of the Philippine Islands" prepare a chart representing the amount of copra produced in the Philippines. 2. Divide the amount into parts representing the production of the chief copra-producing provinces. 3. Compare these. 4. Using these data and referring to Miller's "Commercial Geography" and Miller and Polley's "Intermediate

Geography," prepare a map of the Philippine Islands which will indicate the copra-producing regions.

5. Explain why coconuts are not grown extensively in other regions. 6. By comparing the number of planted trees with the number bearing fruit estimate what will be the production of copra in the Islands seven years hence. 7. Make a chart representing the total number of trees planted in the Philippines, and divide it into sections representing the trees planted in the principal provinces. 8. Will there be any important changes in the proportion of copra produced in the various provinces seven years from now? 9. What provinces could increase their production by decreasing the local consumption of nuts, oil, and tuba?

10. Secure the necessary data from the latest annual reports of the Collector of Customs, and bring Charts VIII, X, XI, XII down to the present time. 11. Comment on these new figures. 12. Comment on the importation of copra into the Philippines. 13. Where is Philippine copra now sent? 14. Make a chart showing the amounts of copra and oil exported from the Philippines since 1912, and the prices of copra and oil.

15. Make a chart showing the uses of the coconut palm.

16. The difference between oils and fats. 17. The kinds of oils as to source and use. 18. Fixed and volatile oils. (Miller.)

19. The uses of oils, fats, and waxes. 20. The world's production of copra and the commerce in it. (Miller.)

21. The dairy industry of the world, and its relation to coconut oil. (Miller, and other commercial geographies.)

22. Coconut oil used in imitation lard, salves, lotions, and soap.

23. Vegetable and animal oils and fats. 24. Where produced and used (illustrated with maps). 25. International trade. 26. The substitution of one for the other. 27. The oil industry of Marseilles, France. 28. Uses for coconut-oil cake. (Miller; Finch and Baker; and other commercial geographies.)

29. The manufacture and uses of desiccated coconut.

SELECTIONS ON THE THEORY OF ECONOMICS TO BE APPLIED TO THE MATERIAL IN THE CHAPTER

1. The laws of consumption. (Bullock, pages 13-21.)
2. The law of economy in organization. (Bullock, pages 82-91.)
3. The laws of supply. (Bullock, pages 91-96.)

CHAPTER VII

SUGAR AS AN EXPORT CROP¹

EARLY HISTORY

Sugar cane is not known as a wild plant, but its early home was probably in Bengal or Cochin China; botanic, linguistic, and historic facts support this theory. Sugar was first mentioned² in Chinese writings of the second century before Christ. In the eighty-sixth year of the Christian Era the kingdom of Funan sent a tribute of sugar to an emperor of the powerful Han dynasty then ruling China. In the seventh century the Chinese emperor Taitsong, carrying out a well-defined policy for increasing the prosperity of the realm, sent a man to the Indian province of Bahur to study the methods of sugar making. The embassy seems to have been successful; for when Marco Polo visited China, six centuries later, he found that large quantities of sugar were being produced. The industry flourished in other parts of the East also. Vasco da Gama, visiting Calicut in 1498, found the sugar trade of that port worthy of special mention.

While the sugar industry was thus becoming well developed in the East, a definite knowledge of the product was advancing westward, largely through the agency of Greeks, Saracens, and Venetians. In 327 B. C. Alexander the Great invaded India, and is said "to have feasted on solid honey, not made by bees, which was procured from the stem of a reed." The Greeks called the new substance "Indian salt."

According to Seneca and Pliny the Elder the fame of both India and Arabia as producers of sugar was well established in Europe by the first century of the Christian Era, although but

¹ By Charles H. Storms.

² W. C. Stubbs's "Sugar Cane."

few Europeans had at that time ever tasted the substance. The Saracens carried the cane with them in their advance across northern Africa. Through the Saracens the Venetians became interested in sugar as a commercial product. These two peoples introduced the culture into Arabia, Egypt, Nubia, Ethiopia, Sicily, and Spain. By the end of the thirteenth century the sugar industry was well known in China and India, and in the countries surrounding the Mediterranean Sea. Sugar was not unknown in England, but was still regarded somewhat as a curiosity.

In the Middle Ages the city of Venice, then the commercial leader of the world, became the center of the sugar industry. The Venetians carried the sugar trade into England. In 1319 was recorded the first sugar trade in the English market, in which a hundred thousand pounds of sugar was exchanged for wool. At that time sugar was valued in Scotland at from seventy-five to eighty centavos a pound.¹ In 1912 the price had fallen to eight or ten centavos a pound.

Even at this early age the Venetians recognized the possible advantages to be derived from improved methods of production, and rich prizes were offered to stimulate inventive ability. The Venetian inventor of the art of making loaf sugar received a reward of a hundred thousand crowns. In 1503 the Venetians introduced into Europe the art of refining sugar.

Thus during a period of fifteen hundred years the Indians, Chinese, Saracens, and Venetians each played an important part in the advancement of the sugar industry. The industry then fell into the hands of the rising powers of Spain and Portugal. In 1425 Dom Henry of Portugal sent seed canes to the Canary and Madeira islands. After the discovery of America, Peter Etienza sent cuttings to the island of Santo Domingo, from which cane was carried to Mexico, South America, and northward into the newly opened territory of Louisiana. For three hundred years, however, the Canary and Madeira islands furnished a large part of the sugar supply of Europe.

¹ "Sugar in Louisiana," *Century Magazine*, Vol. XXXV, November, 1887.

Until the latter part of the sixteenth century sugar was used principally as a medicine. The demand was therefore limited, but in 1575 it was greatly increased by the introduction of coffee, and in 1650 by the introduction of tea. The failure of the mines in the New World had caused a large number of disappointed seekers after wealth to turn to other enterprises, of which sugar production was by far the most attractive. The climate and the soil of the West Indies were known to be well adapted to the growing of sugar cane. Indian slaves were first used for laborers, and then negro slaves were imported; to quote from Bourne, "The development of the sugar industry and the growth of slavery were dependent on each other. Each sugar mill, run by horses or mules, required thirty or forty negroes. Each water mill required at least eighty negroes."

In 1595 a company contracted with the government of Spain for the exclusive right of importing slaves into the Antilles for a period of nine years.¹ They paid the government 900,000 ducats for this monopoly.² From 1680 to 1786 more than 2,100,000 Africans were imported, largely for use on the plantations. Sugar brought a high price in the European markets, and the trade grew rapidly. The port duties on Haitian sugar alone are said to have built many magnificent buildings in Madrid and Toledo.³

The many European wars of the eighteenth century forced Spain and Portugal into the background among the world powers. England became the mistress of the sea and the leader of the commercial world. The control of the sugar supply of Europe passed from Spain to England, where it was destined to remain until Napoleon should develop plans to bring about a world-wide distribution of the industry.

¹ E. G. Bourne's "Spain in America," p. 273.

² Ibid.

³ Freeman and Chandler's "World's Commercial Products," p. 84.

BEET SUGAR AND THE BOUNTY SYSTEM

This wide distribution came about through the perfection of a process for extracting the sugar content of beets. Although the sugar beet had been known to European farmers for more than two hundred years, a practical method of extracting the sugar was at that time a comparatively recent discovery, and its possibilities were not generally known.¹ The Continental sugar supply was greatly reduced as a result of the Berlin Decree (1805) and the Milan Decree (1807), since they caused the English to blockade the European ports under Napoleon's control. Napoleon planned to supply the consumers of continental Europe with sugar from the sugar beet, and applied the stimulus necessary to insure its cultivation. By Napoleon's orders about eighty thousand acres were planted with beets. The price of sugar in European markets was rapidly advancing. The production of sugar from the beet offered an attractive and lucrative occupation to many of the inhabitants of France and of the German states, and the beet-sugar industry became important in these countries.

The overthrow of Napoleon removed the restrictions on trade, and consequently the price of sugar declined to a point at which many of the farmers could not profitably raise beets. A few farmers in France persisted, however, and some Frenchmen continued to manufacture sugar. They were able to compete with cane-growing countries because of their improved methods of cultivation and manufacture. The industry was not important, however, and in 1829 a production of only four thousand tons was reported. In 1835 the industry was revived in Germany, and after 1840 made a rapid advance. In 1884

¹ In 1590 Oliver des Senes records the introduction of the red beet into Europe; in 1747 Marggraf obtained sugar from beets, but at an enormous expense; in 1797 Achard invented a simpler method of extracting sugar from beets; in 1805 Baron de Koppy built a factory in Lower Silesia, the annual output of which was to be 525 tons; in 1810 Achard built a factory, producing muscovado at a cost of 1s. 6d. a pound, and white sugar at 1s. 8d. a pound (Freeman and Chandler, "The World's Commercial Products," pp. 103-108).

the bounty system was adopted by Germany,¹ and other countries of continental Europe quickly followed her example.

The plan for encouraging the production of sugar varied somewhat in different countries, but the essential features were

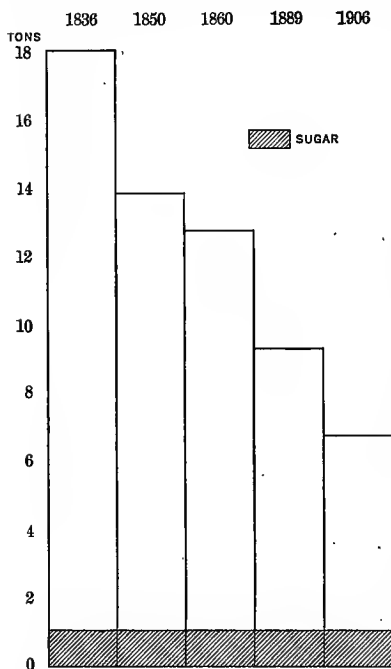


CHART XV. AMOUNT OF SUGAR BEETS NECESSARY TO PRODUCE ONE TON OF SUGAR

Data from *Farmers' Bulletin No. 93*

the same. The government placed a heavy tax on manufactured sugar; but if the product was presented for export, this tax was returned and in addition a present was given the grower for each ton exported. Under the French law sugar used at home cost the grower (the taxes included) about £0.17 $\frac{3}{4}$ a pound. Sugar for export cost from £0.076 to £0.096 a pound because of the rebate.²

The results of the bounty system may be briefly stated. The amount of beet sugar exported was more than doubled in five years. Of the sugar found in the world's markets at that time about three fifths came from the sugar beet. Germany in 1881 produced about 645,000 tons of sugar; in 1885 the yield was 1,150,000 tons. Of still greater importance was the fact that

¹ Encyclopædia Britannica, XXII, 625.

² Beets producing 7 $\frac{1}{2}$ per cent of their weight in sugar were taxed at \$0.05 $\frac{1}{11}$ a pound. Beets producing from 7 $\frac{1}{2}$ to 10 $\frac{1}{2}$ per cent were taxed at half this rate. Beets producing more than 10 $\frac{1}{2}$ per cent were taxed at one quarter of this rate (French law of 1884).

world-wide attention was drawn to the beet-sugar industry, and the aid of experts was enlisted in an effort to lower the cost of production. In about fifty years the yield per ton of sugar from beets was advanced from five to twelve or fifteen per cent.¹ The use of the diffusion process of extracting the sugar assisted materially in securing this result. Perhaps careful seed selection was of even greater importance.

The bounty system proved of unexpected assistance to the people of England, because the French and German consumers had to pay about twelve centavos more a pound for sugar than their near neighbors, the English. The latter were quick to use this advantage. The English farmers devoted their lands to the production of fruits and berries, and the capitalists erected huge factories for canning fruits and manufacturing jellies, jams, and candies. It is estimated that these factories furnished employment for more than 250,000 people.² All continental Europe was forced to purchase its sweets from the English.

Hence the local consumers in continental Europe had cause for complaint. They had to pay ₧0.20 a pound for sugar, while across the Channel in England the same article could be purchased for ₧0.08. The English cane-growing colonies also complained because the bounty-fed sugar had stolen from them the home market.

This state of affairs seemed unnatural in every way and could not be indefinitely continued. After a time public opinion outweighed the influence of the beet growers and the English manufacturers of sugared products. In 1892 England called

¹ In 1836 it took 18 T. beets for 1 T. sugar.

In 1850 it took 13.8 T. beets for 1 T. sugar.

In 1860 it took 12.7 T. beets for 1 T. sugar.

In 1889 it took 9.25 T. beets for 1 T. sugar.

From 5 per cent of sugar, as found by Marggraf, the sugar beet of good quality has increased to 15 per cent and more, and 12 per cent is considered necessary for profitable manufacture (Mary Hinman Abel, *Bulletin 93*, 1906, Bureau of Agriculture, Washington, D.C.).

² *Review of Reviews*, XXVII (February, 1903), 227; *Scientific American* (Supplement), LV, 22, 734.

a conference, at Brussels. Representatives of the powers attended. A union of the important countries producing beet sugar was formed, and a plan of action was ratified. It was decided to abolish the bounty system and establish a uniform customs duty of ₱0.10 on raw sugar and ₱0.11 on refined sugar.¹ Russia alone did not consent to this plan, because under the bounty system the Russian sugar industry was developing at an amazing rate. Some countries still levy a duty on Russian sugar equal to the amount paid by the government to Russian beet growers. In 1907, however, Russia was admitted to the union with the understanding that Russian sugar exports westward were not to exceed 200,000 tons a year. In 1912 arrangements were made for supplementary exports of sugar in case of shortage in European markets. The French and German sugar producers do not now receive a bounty, for they have reduced beet-sugar production to an economical basis not yet obtained by the majority of the cane-sugar producers. The modern beet-sugar factory is a marvelous example of a productive organization in which waste has been reduced to a negligible factor.² It is probable that the Continental countries will revert to a modified form of the bounty system if changing conditions should make a bounty a necessity for the beet growers.

DECLINE OF THE CANE-SUGAR INDUSTRY

While science, wealth, and statesmanship were uniting to establish securely the beet-sugar industry, a far different state of affairs existed in the West Indies, then the chief source of supply of the sugar from cane. The position of the planters there will be understood after a brief glance at their history in the nineteenth century. During the early part of the eighteenth century England controlled the sugar market of

¹ *Scientific American* (Supplement), LV, 22, 734.

² For a description and details of the manufacturing system, see Miller's "Commercial Geography," p. 29; and Newsom and Walker's "Handbook on the Sugar Industry of the Philippine Islands."

the West Indies. The industry at that time yielded immense profits, because the conditions were favorable. The profits were invested, or squandered, abroad.¹ The planters made little attempt to prepare for periods of depression. In 1834 the English government proclaimed the emancipation of the West-Indian slaves. This was a blow to the planters because they understood no labor but slave labor.² The measure of self-restraint necessary in dealing with free laborers had never been practiced by them, and troubles between planters and laborers often arose because of the violence of one or both parties. Moreover, the negroes did not know how to labor as free men. They were careless of their contracts with the planters, and often at a critical period would not labor at all unless paid a large additional sum. Thus they discouraged their employers and destroyed their own means of obtaining a decent livelihood. The government paid about ₧200,000,000 for the slaves. This money the planters expended abroad also, and when labor and other troubles made ready money a necessity, they were almost bankrupt. The usurers supplied the money, but at ruinous rates.

Political disturbances were of frequent occurrence in Cuba during this period. Sugar mills were burned, and lands were laid waste by opposing armies. These losses ruined many planters and disheartened others. The revival of the beet-sugar industry in Central Europe gave a sugar supply greater than the immediate demand, and the West-Indian product was crowded out of the market. Because of this condition and of antiquated methods the planters could not make sugar in competition with the energetic, resourceful producers of beet sugar. In the face of a most dangerous rival the colonial governments and the planters assumed for a time a listlessness which seemed to indicate the ruin of the industry. The production decreased at an alarming rate.

¹ Morris's "History of Colonization," II, 57-58.

² Ibid. p. 197.

RESTORATION OF THE CANE-SUGAR INDUSTRY

Early in the twentieth century, however, we find cane growers united in an attempt to reestablish their product in its old-time position in the world's market. Indeed, sugar-cane growers throughout the world are now adapting to local needs many of the devices of the beet-sugar manufacturers. They are also spending fortunes in experimenting with new processes looking toward the elimination of waste. Java, Cuba, and Hawaii are the leaders in the restoration of the cane-sugar industry.

Java long prospered during the period of its forced-labor system. Even during that period the sugar industry was regarded at times as "an intolerable burden."¹ The change² to free labor began in 1870, and was completed in 1890. Because of ignorance and mismanagement many of the factories were run for years at a loss. As a rule, the Javanese are slow to adopt new methods, but a marked change of policy has been apparent in recent years. Their sugar estates are large, and mills of the latest model have been installed. In 1912 there were nearly two hundred mills in the island. They exported more than 750,000 tons a year to India, China, and Japan, and could increase the amount to 1,500,000 tons. As a result³ of the Spanish-American War, much of the Philippine sugar formerly sent to China was exported to America; Hongkong importers thereafter supplied the deficiency by purchasing annually from Java a constantly increasing amount.⁴

Before 1887 the best Cuban mills extracted sixty-three per cent of the juice of the cane. Modern mills now installed exert a pressure of five hundred tons to the square inch, extracting ninety-five per cent of the juice, and leaving the bagasse practically dry. In 1909 one Cuban company threw out comparatively new machinery, costing nearly a quarter of

¹ *Annual Report of the Governor General of Java*, 1834.

² Day's "The Dutch in Java," p. 393.

³ *The Louisiana Planter and Sugar Manufacturer*, August 6, 1910.

⁴ *The International Sugar Journal*, XIII, 147.

a million dollars, to install the newest model. The same company operates fifty miles of railroad through its fields. The cane is not touched by the laborers' hands from the time that it is placed on the freight car in the field until the ash of the bagasse is removed from beneath the furnace. Thus it is evident that a modern cane-sugar mill is an expensive affair. The opening up of new estates in Cuba, and the enlarging of the cultivated area of the older estates, would indicate the promise of satisfactory profits.

Hawaii is probably the most prosperous of the three leading sugar-producing countries. Her planters have keen business ability combined with energy and forethought. Where conditions have been unfavorable, they have procured the necessary changes. They unite to expend vast sums on experiments. They employ the most economical methods of growing, handling, and treating the cane. As examples may be cited a recently perfected process for the rapid clarification of sugar and a new system of recovering the sugar formerly wasted in the molasses.¹ On many estates the canes are floated to the mills in channels of running water, which may also be used to irrigate the fields. The cost of production in Hawaii is said to be lower than in Java or Cuba. Hawaiian sugar enters the United States duty free, a privilege which in 1914 was worth about \$10,000,000 to the Hawaiian planters.²

The sugar mills of Formosa are of interest to the people of the Philippines, since the Formosan planters are their nearest and most favored competitors. The sugar industry was important in Formosa long before the days of Koxinga. Koxinga, the Dutch, and the Chinese all gave it some encouragement. In 1902 the Japanese government enacted very favorable laws, which included the lease of government land, rent free, financial aid to enterprises employing the most modern methods of culture and manufacture, and modern sugar mills erected and lent to the planters.

¹ *Far Eastern Review* (December, 1911), Vol. VIII, No. 7.

² Taussig's "Some Aspects of the Tariff Question," p. 69.

This policy of government aid has produced revolutionary changes in the methods employed, since the government will extend assistance only to those planters who make use of every approved modern device for reducing the cost per kilo of the sugar produced. Formosa has thus acquired a modern system of production without passing through a long and costly period of experimentation and failure. This result has been attained by a careful study of the methods employed in different countries throughout the world, and by the selection and adaptation of methods which seemed best suited to the needs of the Formosan planters. At one step the old three-roller mills with animal power, and the hand ladle for transferring the sucrose, have been replaced by the twelve-roller steam mill and the electrically driven pump.

HISTORY OF SUGAR IN THE PHILIPPINES

There are no reliable data concerning the introduction of sugar cane into the Philippines. The suggestions have been made that certain varieties came from Java, others from Formosa, and at least one variety from Tahiti, brought, presumably, by the Spanish.¹ In some regions the primitive implements used in cane culture still bear Chinese names; this suggests that the Chinese had much to do with the establishment of the industry in the Islands.

For three hundred years after the arrival of the Spanish, Philippine sugar was of little commercial importance. Sugar growing was confined to the provinces of Pampanga, Batangas, Cavite, Cebu, Iloilo, and Negros. Finally disturbances in distant sugar-producing areas interfered with the world's supply, and created a demand for the Philippine product. During the Crimean War this demand caused local prices to advance to \$11 and \$12 (Mexican) per picul of 137½ pounds. Although this price did not hold for any length of time, it served to draw the attention of sugar brokers to the Philippines as a

¹ Philippine Census, IV, 26.

possible source of supply. The opening of the Suez Canal, in the year 1869, also added greatly to the importance of the Philippine sugar fields, since it opened up a more direct route between the Orient and the Western World, and thus reduced the distance from Manila to Liverpool to less than ten thousand miles. The general effect which this had on the sugar industry in the Islands may be seen in Chart XVI.

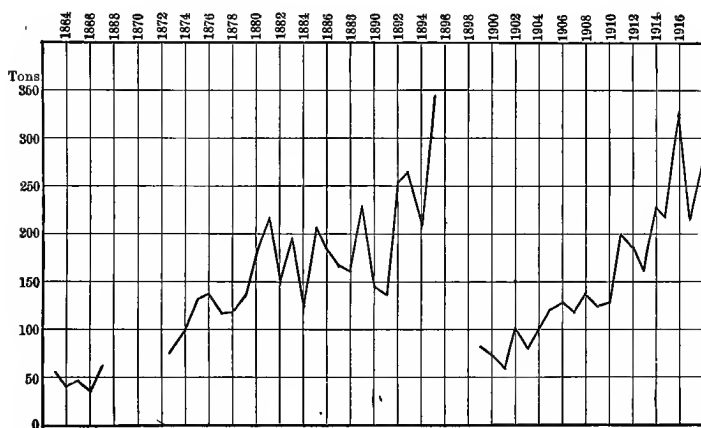


CHART XVI. PHILIPPINE SUGAR EXPORTS; QUANTITY IN THOUSANDS OF TONS

Census and Customs Statistics

In 1877 a British firm established a sugar central at Mandaluyon, on the Pasig River, about three miles from Manila. The plan was to lay pipes from such mills as were in the more immediate neighborhood, and pump the cane juice to the central. A fleet of schooners was equipped with tanks to bring the juice from the mills situated at a greater distance from the central. It was hoped to extend this service as far as the Visayan Islands. The mill turned out to be an unprofitable investment, and in 1880 its doors were closed.¹

¹ Foreman's "The Philippine Islands," old edition, p. 312.

In 1893 the total production of sugar was 300,000 tons, of which 261,686 tons were exported.¹ The supply came from eighteen provinces, with the island of Negros far in the lead. Conditions in Negros at this time were ideal. Labor was cheap. There were plenty of work animals. When necessary, American and English firms supplied the working capital. The methods, however, were primitive and wasteful.

In 1897 there were in the Archipelago three thousand plantations, each with a small mill. In Luzon the share system was popular. The landowner not only leased to the tenant as much land as he individually could care for, but also provided carabaos, wooden plows, and other farming implements. The tenant received from one third to one half of the sugar, but the cost of crushing the cane and making the sugar was deducted from his share.² In the southern islands the laborer received a stipulated daily wage, usually from ₱0.20 to ₱0.50. Many children found employment in the cane fields.

PERSISTENCE OF ANTIQUATED PHILIPPINE METHODS

Since 1897 the sugar industry described above has not been profitable. All productive work was demoralized during the political disturbances of 1895-1899, a period for which we have little reliable data. In 1901 the exports were only one third of those of ten years before, and the renewed activity shown in other kinds of work is not found to the same degree in the sugar industry. The reason for this is plain. While the planters in other countries had been reducing the cost of production, usually by increasing the number of tons per acre obtained from the original expenditure, the planter in the Philippines had faced a gradually increasing cost per ton of sugar. Indeed, the cost for the average farmer was nearly

¹ In 1893 the United States and Canada took about thirty per cent of the exports; Great Britain took thirty-seven per cent; the rest was divided between China and Japan, with the exception of a small shipment to the continent of Europe (Census of the Philippine Islands, IV, 30).

² Foreman's "History of the Philippines," p. 313.

twice as much as it had been twenty years before, whereas the price of sugar in the world's market continued to be held fairly steady because of the competition which existed between the cane-sugar and the beet-sugar interests.¹

The fluctuations, decline, and rise in the price of sugar produced in the Philippine Islands may be seen by looking

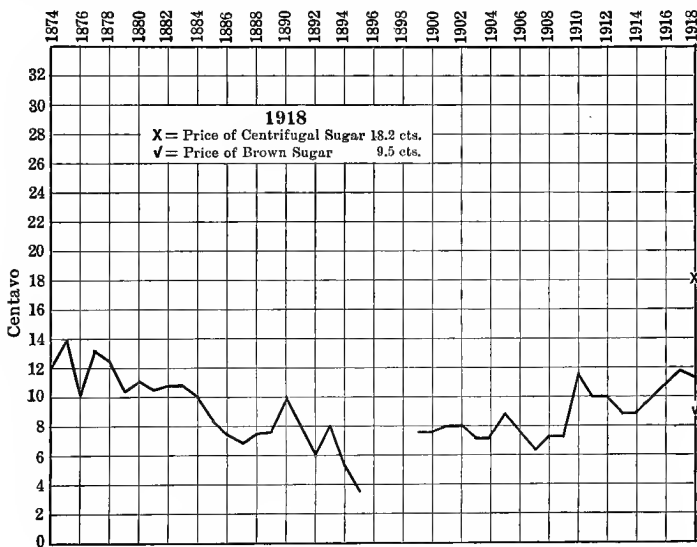


CHART XVII. PHILIPPINE SUGAR EXPORTS; PRICE PER KILO

Census and Customs Statistics

at Chart XVII. From 1877 to 1895 the downward tendency in the price of Philippine sugar may be explained by the presence in the world's market of a constantly increasing quantity of beet sugar.

Many reasons for the increased cost of producing sugar have been given. Among those mentioned are the increasing cost of labor and of work animals, the necessity for borrowing

¹ The Philippine Census, 1903, IV, 32.

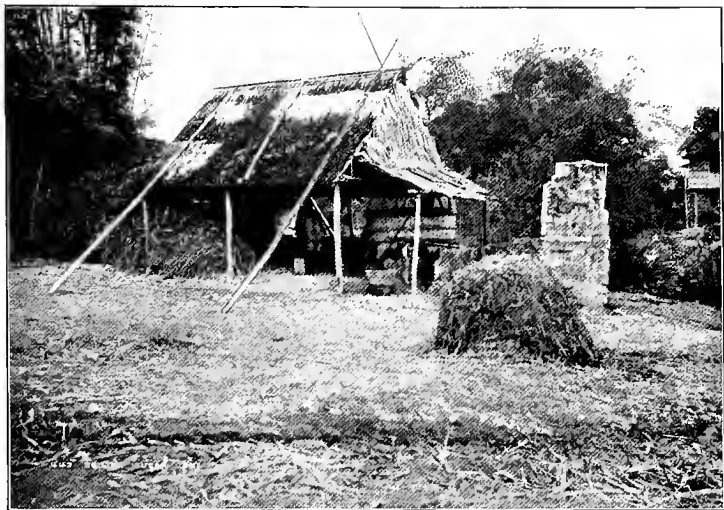
money, and the losses due to drought and locusts. A reason more weighty than any of these is that the planters who complain of the increased cost of production are trying to use in modern times and under modern conditions the methods and the machinery which were successful during the earlier days of the cane-sugar industry. For example, in 1911 sixty-four mills were employed to grind the cane from two thousand hectares in Central Luzon. Thirty-four of these mills were run by carabaos; the rest were small steam mills. The former obtained about half of the cane juice; the latter, from sixty to sixty-five per cent of it. The product, if it is to be exported in competition with that from other countries, must be able to compete with the product from mills which are extracting at least ninety-five per cent of the juice.¹

The district mentioned is fairly typical of many of the cane-planted areas of the Islands to-day. In a section of Iloilo Province the proportion of machines which are worked by animal power is a little larger; the number of hectares per mill is about the same.² The sugar which these mills are producing is of a low grade, but the cane as a rule is grown on high-grade sugar lands.

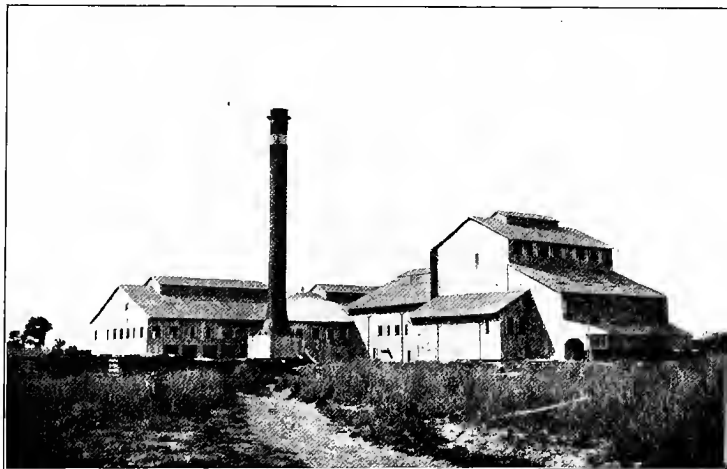
From the foregoing pages it is evident that although the Philippines had modern sugar machinery sixty years ago, or about the time of the Crimean War, for various reasons they have not progressed so rapidly as other producers in the cane-growing tropics. During the past twenty years the gulf has been widening rapidly. A revolution in methods similar to that which took place in Formosa was needed to place the Islands among the sugar-producing regions of world-wide importance. The first measures in that revolutionary change have already been taken; these measures have been adopted as the result of the opening of a new sugar market for the product of the Philippines, namely, the United States.

¹ Economic reports by James H. Bass, Pampanga.

² Economic reports by William E. Mack, Iloilo.



AN ANTIQUATED BOILING PLANT



A MODERN CENTRAL ON MINDORO
PHILIPPINE SUGAR MILLS

MARKETS FOR PHILIPPINE SUGAR

Very early in the history of the Philippine sugar industry England and the United States appeared as the most acceptable purchasers. The opening of the Suez Canal was an important factor in the development of the trade with the former. The European buyers, however, did not greatly care for our sugar because of its low grade and the consequent high cost of refining it. With the appearance in European markets of

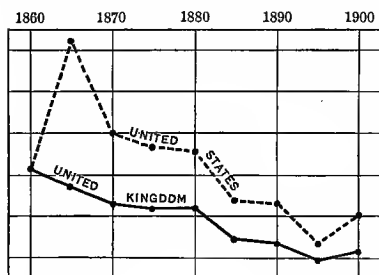


CHART XVIII. WORLD'S SUGAR PRICES

After Bartholomew

large quantities of high-grade beet sugar, Philippine sugar was crowded out, and exporters sought, in China and Japan, markets which could not purchase beet sugar because of the cost of transportation. Japanese markets were of little importance to the Philippines on account of the rapid development of sugar fields in Formosa.

The Philippines produced low-grade, cheap sugar, a kind demanded in China. A little of the best of our muscovado could be taken by the United States. The prospects for the Philippine sugar industry did not look bright. Then came the Payne Bill of 1909, which gave the Philippines a preferred market in the United States; Philippine sugar was admitted free, whereas sugar from Cuba and Java paid a heavy duty.¹ Charts XVI and XVII indicate the increase in the production and the price of sugar from 1910; Chart XIX shows how our best sugar was diverted from China and Japan to the United States. Only the lowest grades continued to be sent to China.

¹ In 1912 the American tariff on sugar of 96° test was about ₱65.488 per long ton.

The demand in the United States is not for muscovado, but for the almost pure centrifugal sugar of the modern centrals. Our favorable position encouraged capital to invest in sugar centrals here. Among the first to be built was that at San José, Mindoro. Here a large sugar estate has been developed, and a mill built to handle the cane. In San Carlos, Occidental Negros, another type of central has been in successful operation. It is conducted on the basis of mutual contract; the owners grow little or no cane, but grind for the neighboring planters, taking in payment less sugar than was formerly wasted in the bagasse.¹ Until the war cut off the supply of machinery, there was a rapid increase in the number of centrals built in the Islands. The centrals in the table on the following page were in operation in 1918.

The export of sugar to the United States in 1917 (Chart XIX) represents, to a certain extent, the centrifugal output of the Islands. During the World War freight rates were so high that it was difficult to ship muscovado; hence most of it was sent to Japan and China. In 1918, however, the United States took most of the high-grade muscovado as well as practically all of the centrifugal sugar.

In 1918 about 64,000,000 kilos of centrifugal sugar, valued at more than ₱11,700,000, were exported, and about 210,000,000 kilos of raw sugar, valued at about ₱19,800,000. The centrifugal sugar was worth about eighteen centavos a kilo; the raw sugar, about nine centavos. This indicates how much money the Islands are losing by exporting raw instead of centrifugal sugar; for the United States will take all the centrifugal sugar we can produce.

FUTURE OF THE PHILIPPINE SUGAR INDUSTRY

The two markets for Philippine sugars are both encouraging: China and Japan for raw sugar, and the United States for centrifugal sugar.

¹ Newsom and Walker's "Handbook on the Sugar Industry of the Philippine Islands," p. 17.

NAME OF FACTORY	WHERE SITUATED	WHEN BUILT	DAILY CAPACITY IN TONS OF CANE
Calamba Sugar Estate . .	Canlubang, Laguna	1913	1800
San José Milling Co. . . .	San José, Mindoro	1910	1000
San Carlos Milling Co. . .	San Carlos, Negros Occidental	1914	800
North Negros Sugar Factory	Manapla, Negros Occidental	1918	600
Bearing Central	Cabancalan, Negros Occidental	1914	500
Philippine Sugar Dev. Co.	Calamba, Laguna	1914	300
De La Rama Central . . .	Bago, Negros Occidental	1913	300
Guanco Central	Hinigaran, Negros Occidental	1913	300
San Isidro Central	Cabancalan, Negros Occidental	1917	250
Carmen Central	Calatagan, Batangas	1914	200
Palma Central	Ilog, Negros Occidental	1916	200
San Antonio Central . . .	La Carlota, Negros Occidental	1913	150
Dinalupihan Factory . . .	Dinalupihan, Bataan	1913	125
Talisay Central	Talisay, Negros Occidental	1913	125
Canlaon Factory	Canlaon, Negros Occidental	1913	125
Muntinlupa Factory . . .	Muntinlupa, Rizal	1912	100
Saint Luis Oriental Factory	Manaoag, Pangasinan	1912	90
<i>Small factories using open train evaporators and vacuum pans:</i>			
Pampanga Sugar Factory .	Floridablanca, Pampanga	1916	120
Bernia Factory	Dinalupihan, Bataan	1918	90
Kennedy Factory	Isabela, Negros Occidental	1918	90
De la Viña Factory . . .	Vallehermoso, Negros Oriental	1918	90
Tubigan Sugar Factory . .	Tubigan, Bohol	1917	60
<i>Factories under construction or projects definitely planned for immediate development:</i>			
Pampanga Sugar Central .	Floridablanca, Pampanga		1500
Bais Sugar Central	Bais, Negros Oriental		1000
La Carlota Sugar Central .	La Carlota, Negros Occidental		1000
Isabela Sugar Central . . .	Isabela, Negros Occidental		600

A careful study of the Formosan sugar fields suggests that they cannot produce more than three fifths of the sugar demanded by the Japanese consumers. In Japan the consumption of sugar was twelve pounds per capita. This has increased more rapidly than the population of that country,¹ on account

¹ Y. Takekoshi's "The Japanese in Formosa," p. 242.

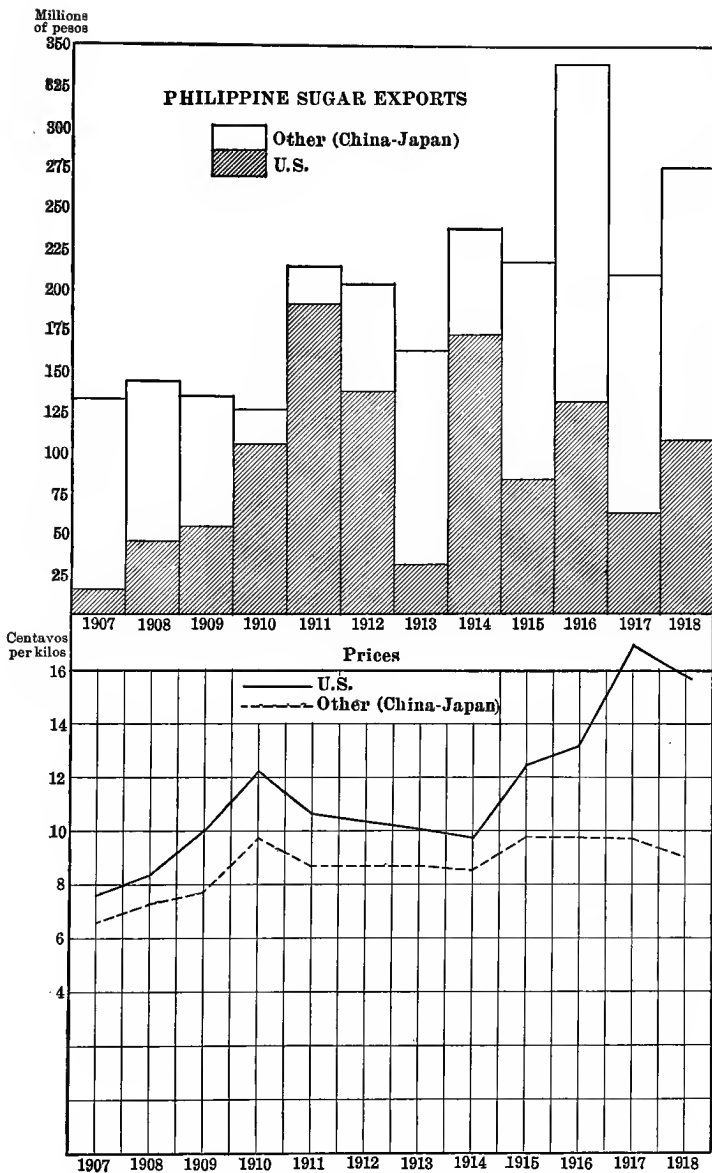


CHART XIX. PHILIPPINE SUGAR EXPORTS

Customs Statistics

of many influences tending to an improved standard of living. A similar result should appear in China in the near future for the same reason. If the Chinese should use as much sugar per capita as is used by the United States, the Chinese markets would absorb practically the whole of the present sugar production of the world.¹ In estimating markets, however, we have to remember the possible development of beet-sugar interests in Korea and Manchuria, and the expansion of beet

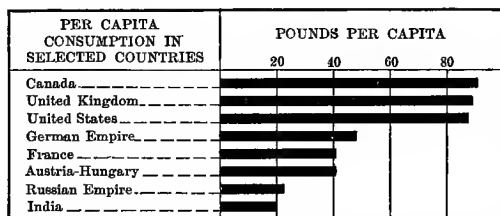


CHART XX. CONSUMPTION OF SUGAR PER CAPITA
IN 1903

Finch and Baker

culture already well organized in southern Australia. Sugar entering any of these countries must be prepared to compete with the local output.

The United States is to-day the most valu-

able potential buyer of sugar that the Islands have, and it is hardly possible that the full development of the cane fields of Hawaii, Cuba, Porto Rico, and the Philippine Islands will meet the demands of the consumers in that country.

Moreover, the United States will continue to be affected by the sugar shortage in Europe. So many beet fields and sugar mills have been destroyed in France, Belgium, and Poland that it will take many years to revive the industry; meanwhile Europe must draw on the tropics for part of its supply. This will take sugar from Cuba and Java, and increase the demand for Philippine centrifugal sugar in the United States. New sugar centrals will doubtless be erected in the Islands both with and without government assistance.²

¹ Lecture by Walter E. Gonder, Bureau of Science, Manila, P. I.

² The government of the Philippines is empowered to purchase a certain amount of interest-bearing, first-mortgage bonds of corporations organized for erecting and operating sugar centrals.

Some of these centrals will be built on land newly brought under sugar cultivation, but much sugar cane from old fields will also be taken to them. Hence, as the export of centrifugal sugar increases, somewhat of a decrease in the export of raw sugar may be expected.

In the next few years, unless the Islands lose the United States market, the total amount and value of Philippine sugar exports will undoubtedly increase substantially.

SUGGESTIONS FOR REVIEW AND ORIGINAL WORK

SUGGESTIONS BASED ON THE TEXT

1. Give a brief history of the world's cane-sugar industry.

2. Explain the effect of the beet-sugar industry on the decline of the cane-sugar industry. 3. What two circumstances resulted in placing the production of beet sugar on a competitive basis with cane sugar? 4. How have these two methods been applied to the cane-sugar industry?

5. Under what circumstances was the export sugar industry of the Philippines originated? 6. What gave the second impetus to the growing of sugar here? 7. Why did it decline after 1897? 8. What circumstances gave it renewed vigor? 9. From what year does its present prosperity date? Explain. 10. Why may Hawaii be taken as a model for the Philippines in sugar production? 11. Why does the sugar industry of Formosa interest us? of Java? of Cuba?

12. Explain why modern sugar plantations with centrals are being developed by corporations instead of by individuals. 13. You are the owner of ten hectares of sugar land, and have an iron crusher and open kettles of your own. The land about you is well developed in sugar cane. The holdings are small, and there are no chances of consolidating them. Yours is the best sugar-making plant in the district, but you realize that you could make more money if you could have your cane handled by a modern central. Explain in detail two arrangements under which a central might be erected to handle your cane and that of your neighbors.

14. You are considering the advisability of investing in sugar-cane lands. Give your ideas on the subject.

SUGGESTIONS FOR THE STUDY OF LOCAL CONDITIONS

1. Commercial forms of cane sugar. 2. Other sugars observed.
3. The importance of sugar cane. 4. Export or import of sugar. 5. Sugar lands that might be developed.
6. Alcohol and alcoholic beverages.
7. Vinegar.

SUGGESTIONS FOR REPORTS FROM REFERENCES, ESPECIALLY FROM COMMERCIAL GEOGRAPHIES

1. The world producers of cane sugar; of beet sugar. The importers and consumers of sugar. Illustrated with map and charts. (Finch and Baker; Miller.)

2. A comparison of the processes in the production of muscovado and centrifugal sugar. 3. Processes in the manufacture of beet sugar as compared with those in the production of sugar from cane. 4. The modern sugar central. 5. The equipment of a modern sugar hacienda. 6. Refining sugar. (Miller; Toothaker; Bishop and Keller.)

7. From the latest "Statistics on Principal Crops of the Philippine Islands" prepare a chart representing the amount of sugar produced in the Philippines. Divide it into sections representing the production of the chief sugar-producing provinces. Compare these. 8. Using these data and referring to Miller's "Commercial Geography" and Miller and Polley's "Intermediate Geography," prepare a map of the Philippines showing the sugar-producing regions, and locate on it the existing sugar centrals. Explain the soil and climatic conditions which make each important region favorable for growing sugar.

9. Grades of Philippine muscovado sugar. 10. Their sources and qualities.

11. Secure the necessary data from the latest annual report of the Collector of Customs, and bring Charts XVI, XVII, XIX down to the present. Comment on these new figures. The two markets for Philippine sugar.

12. From the lessons of the World War explain how the Philippine sugar industry depends on shipping. The necessity for capital in the sugar industry to enable the producers to manufacture,

market, and at the same time replant. How the necessary capital for all these things may best be obtained.

13. The world's sources of sugar, commercial and local.
14. Make and explain a chart of the uses of sugar cane.
15. Philippine palm sugar. 16. The uses of the sugar palm.
17. Possibilities of commercial sugar production from the nipa palm. (Miller.)

18. The world's sources of alcohol. 19. Industrial uses of alcohol. 20. Alcoholic beverages, distilled and fermented. 21. The chief kinds. 22. The wine grape industry of the temperate zones.

23. The production and consumption of alcohol in the Philippines. 24. Government regulation.

25. The distribution of the nipa palm in the Philippines.
26. The nipa swamps of Pampanga, Bulacan, and the distillery industry there. 27. The rectifying industry in Manila. 28. The production of alcohol from the coconut palm in Laguna, Albay, etc.

29. How alcohol is distilled.

30. Philippine fermented beverages, such as tuba and basi.

31. Industrial alcohol. Government control. Uses.

SELECTIONS ON THE THEORY OF ECONOMICS TO BE APPLIED TO THE MATERIAL IN THE CHAPTER

1. The restriction of international trade. (Bullock, pages 240-254.)

2. Why does Philippine sugar sell in the United States at a higher price than in other countries?

3. The duty on 96° sugar imported into the United States from Java is 1.256 cents a pound. In 1918 how much did the Philippines make because of the fact that its sugar did not pay this duty? Who paid this bill? Why?

CHAPTER VIII

TOBACCO AS AN EXPORT CROP

MARKETS FOR PHILIPPINE TOBACCO

The present markets for Philippine tobacco are three in number. There is a large domestic consumption of locally grown leaf and of cigarettes made in Manila. There is also, normally, a considerable export of cheap leaf to Europe, especially to Spain and France, the source of much of which is

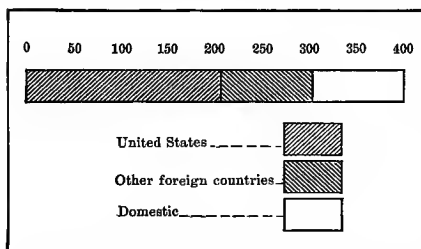


CHART XXI. CONSUMPTION OF PHILIPPINE CIGARS IN MILLIONS

Internal Revenue Statistics, 1917

the Visayas. Since the enactment of the Payne Bill a large market for good Philippine cigars has been opened in the United States. The amount of tobacco consumed in the manufacture, though relatively small, is of high grade and value; it comes principally from the

Cagayan Valley. Chart XXI indicates that the cigar industry, which involves much capital and labor, is essentially an export industry. Three fourths of the product is exported; one half of the product goes to the United States. In 1910, immediately after the Payne tariff went into effect, there was a large export to the United States of Philippine cigars, many of which were of inferior grade. This tended to give Philippine cigars a bad name in the United States, and in 1911 exports and prices fell sharply; exports continued to decrease steadily, and by the end of 1914 reached

for that year the total of fewer than 60,000,000 cigars. As a result of investigations and the recommendations made to the governor-general by the Collector of Internal Revenue, the Legislature, in February, 1916, passed Act Number 2613, providing for improvements in growing and curing tobacco. It places the control of the classification of tobacco for export in the hands of the Collector of Internal Revenue, by a system

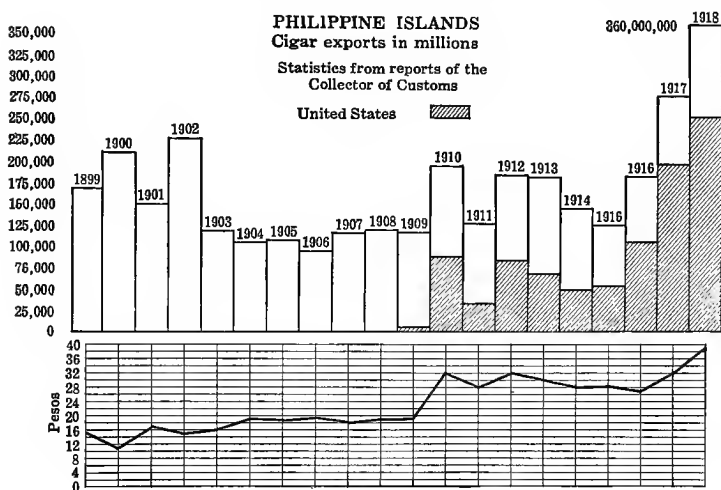


CHART XXII

of inspection ; it assesses inspection fees to pay the expenses of enforcement, and conducts a propaganda of advertising and publicity for the purpose of increasing the tobacco trade between the Philippines and the United States. The law provides, also, with certain limitations, for the protection of exporters against loss on account of tobacco products that become damaged en route from Manila to the United States. It is intended that this protection, together with advertising and publicity, shall make the Manila cigar business attractive to American dealers, and also protect the good name of Manila cigars by keeping damaged cigars from the consumer.

In 1917, as a practical result of this provision of law, bills amounting to ₱9,093.18 were paid from the Tobacco Inspection Fund. Both the Manila factory owner and the importer in the United States were protected against loss; damaged Manila cigars were kept out of the American market until they could be reconditioned; and the confidence and good will of the American dealers were maintained. The results may be seen on Chart XXII, in the exports for 1917-1918 and preceding years.

The domestic consumption of Philippine tobacco, cigars, and cigarettes, and the exports of the inferior leaf to Europe and of cigars to China, need no particular discussion. The Philippine tobacco problem is to produce a sufficient quantity of higher-grade leaf to meet the increasing demand for Philippine cigars in the United States, and to increase the number of cigar makers in Manila.

It is true that in 1914 there began an important export of leaf tobacco to the United States. The details can be determined from the following figures of exports:

LEAF TOBACCO EXPORTED FROM THE PHILIPPINES IN KILOS

	TOTAL EXPORTS	TO THE UNITED STATES
1915	11,186,000	39,000
1916	17,986,000	633,000
1917	7,864,000	3,283,000
1918	25,720,000	2,957,000

This exportation was, however, the result of conditions due to the war; a great demand was made on the United States for tobacco to supply not only the armies in Europe, but the populace as well; its own crop was short, and hence it drew on the world's crop. With the end of the war the demand for Philippine leaf tobacco in the United States ceased, and in 1919 the exportation was trifling. Moreover, as soon as space for cargoes became available, the pre-war export of leaf tobacco to Spain and France was renewed.

For the future, therefore, we may expect three important markets for Philippine tobacco: (1) the large domestic market for cigars and cigarettes; (2) a remunerative market for cigars in the United States, a market demanding the best class of tobacco that the Philippines can produce, and amounting to about half the value of the total exportation of tobacco; (3) a large market in Europe, especially Spain and France, for low-grade leaf tobacco. In addition, the minor markets for cigars and cigarettes in China and other countries of Asia will continue, as well as those in Europe.

HISTORY OF PHILIPPINE TOBACCO

Tobacco was introduced into the Philippines from Mexico at an early date; in 1759 it was already being grown on the island of Cebu. It received its first impetus, however, from the monopoly of tobacco established in 1782. From the beginning of its use in commercial quantities tobacco has been particularly subject to government monopoly and regulation for revenue. To-day France, Italy, Japan, and Turkey have government monopolies which regulate its growing, manufacture, and sale. In other countries, as the United States, tobacco is subject to high internal revenue taxes. The chief purpose of the monopoly of tobacco in the Philippines¹ was to get revenue. Previously the colonial government had not been able to raise enough money by taxation to meet its expenses. Systematic opposition to all extensive agricultural enterprises arising from private initiative had developed, and agricultural and industrial progress had been slow. Moreover, the high profits of the trade centering at Acapulco, Mexico, drew

¹ Most of the information on the monopoly of tobacco presented in this chapter is taken from a report made to the Director of Education on this subject by Mr. David W. Lucas, of the Philippine School of Commerce. This information was obtained from Blair and Robertson, *Bulletin No. 58* of the Bureau of Labor, Washington, D. C., and from the report of United States Consul Webb, of Manila, in "House Miscellaneous Documents," 1889-1890.

attention away from the surer but smaller income from agriculture. But since the ship from Acapulco came but once a year, the total profits from this trade were much less than the profits from agriculture and manufacture would have been, had the energies of the wealthy been directed to them. Therefore the wealth of the country remained so small that it was impossible to raise much money by taxation, and Mexico sent funds annually to help to run the government of the Philippines.

In 1782 Governor Basco y Vargas, by authority of a royal order, established the monopoly of tobacco. It was managed directly by the government and limited the cultivation of tobacco to certain districts, at first Gapan in Nueva Ecija Province, some municipalities in Bulacan and Cagayan, and the island of Marinduque; later the area which might be cultivated was increased. In the most fertile sections nothing but tobacco could be grown. The government determined the amount which any man might cultivate, and bought the whole crop at a fixed price, selling it again at a good profit.

As a revenue measure, the monopoly was highly successful. Not only did the subsidies from Mexico become unnecessary, but money was actually sent back to Spain as a balance for sums previously sent over by Mexico. One writer said that this monopoly could become a greater source of revenue than all the others of the colony. By 1882, when the monopoly was abolished, its gross annual revenues were about four million pesos.

The monopoly was abolished on account of the evils connected with it. From the first, graft existed; some tobacco escaped the officers. The hill tribes in their bamboo fortresses raised tobacco and smuggled it down to the lowlanders. Agents of the government bought the tobacco from the planter, turned it over to the government as a higher grade, and pocketed the difference. But these were lesser evils. The greatest wrong was in buying the tobacco at too low a price and paying for it in promises. Seven years after the abolition

of the monopoly the price paid the planter had doubled, which showed that the grower had been paying an unjust proportion of the government revenues. The effect of the monopoly was to make him pay half of his gross income as a tax. At first the grower was paid for his product at once, but afterwards scrip was issued, payable at the option of the government.

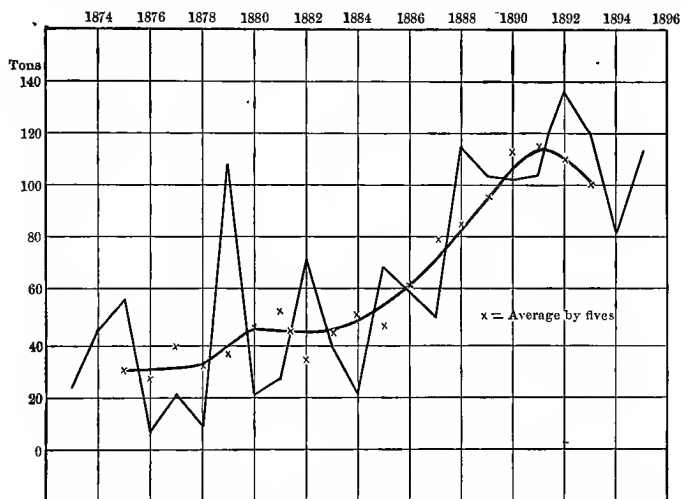


CHART XXIII. TOTAL PHILIPPINE TOBACCO EXPORT, 1873-1895.
QUANTITY IN THOUSANDS OF TONS

Census Statistics

For a while these promises were redeemed promptly; later, however, payment was deferred until the value had decreased by a third. Many times the planter, needing his money at once, sold the scrip to speculators for as little as one tenth of its face value, thereby getting just one twentieth as much as he did seven years after the abolition of the monopoly.

Although the chief aim of the tobacco monopoly was to secure revenue, it also resulted in the production of a higher grade of tobacco. This was accomplished by close supervision.

Each province was divided into districts in charge of a head officer, under whom were the gobernadorcillos and tenientes. The total amount of tobacco to be raised was determined in Manila, as well as the kind, the color, and the grade. The governor of each province received orders from Manila and apportioned to each district its share of tobacco to be grown; then each municipality and barrio was allotted its share. The inspector rode over his district and destroyed any tobacco that was not up to the specifications. In this manner a more carefully cultivated and cured crop resulted than has since been marketed.

FACTORS WHICH REDUCE QUALITY

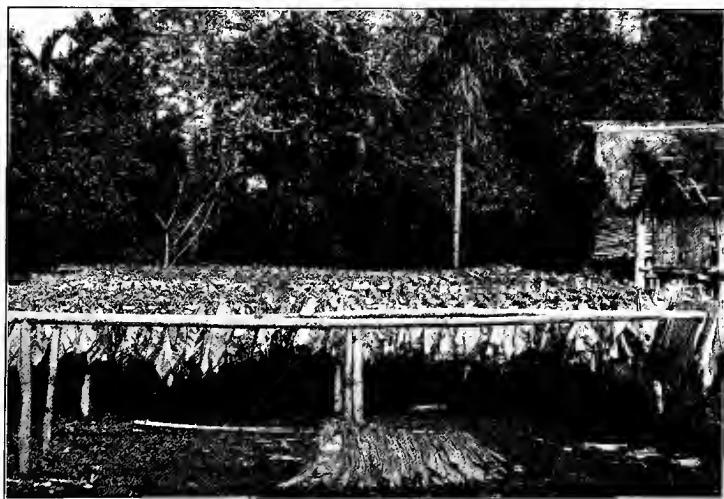
During the life of the monopoly of tobacco the industry had been principally established in the Cagayan Valley. When the tobacco growers were freed from restraint, there was a great increase in the amount of tobacco raised throughout the Islands; most of it was consumed locally; some of it made up the increased exports noted on Chart XXIII. However, the Cagayan Valley has remained the chief tobacco region in the Philippines on account of its favorable soil and climate.

The grade of tobacco now produced in this valley is very low in comparison with the quality which could be raised. One of the chief causes of this has been the lack of supervision over the small growers, who produce the bulk of the tobacco, and who are ignorant of the proper methods of culture and curing. There are not many large plantations in the Cagayan Valley; it is estimated that nine tenths of the tobacco grown there is raised on more than twenty thousand small plantations, averaging an acre each.¹ The problem is to instruct or supervise these small growers, so that the naturally excellent leaf will be turned into good tobacco. Nature now grows a good tobacco there, but man, begrudging his small share of effort, injures it before it reaches the channels of trade.

¹ John S. Hord, in the *Agricultural Review*, Manila, Vol. III, No. 4, p. 222.



CURING UNDER A HOUSE



DRYING IN THE SUN
REDUCING THE GRADE OF PHILIPPINE TOBACCO

Most of the tobacco raised by the small growers reaches the factory agents or large dealers through buyers. Some of these men buy all classes of tobacco regardless of its quality; in certain localities the fixed rate paid for all leaf during the monopoly still persists. Just as in the abaca trade, the producers, not receiving a correspondingly high price for better grades of tobacco, have no incentive to produce other than the low quality. There is no need of their expending effort to produce a high grade when with less labor they can make

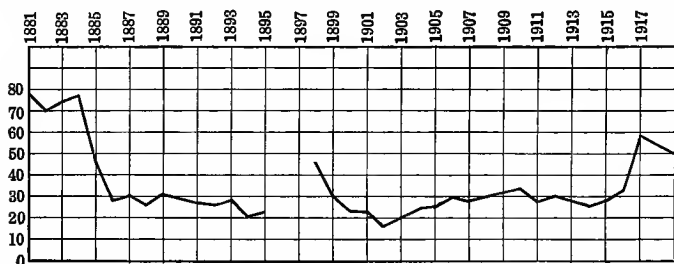


CHART XXIV. PHILIPPINE LEAF TOBACCO; EXPORT PRICE PER KILO
Census and Customs Statistics

as much money from a low grade. Even when the growers sell by quality, the buyers classify the leaf as low as possible, reclassifying it higher when they sell it.

The pernicious system of advances which applies to all Philippine industries is particularly in evidence in the Cagayan Valley. The ignorant planters are at the mercy of the small buyers, who lend them money on growing crops at exorbitant rates of interest, compelling them to sell their product at an exceedingly low price.

Hence it is that the ignorance of the small farmers in the Cagayan Valley has resulted, first, in the production of a tobacco of much lower grade than should be grown in that region, and, secondly, in the farmers' being imposed on by dealers and kept in a state of poverty with no incentive to improve either their product or their lot in life.

The poor methods which result in low-grade tobacco begin with the seed beds;¹ these are seldom well situated, and are neither properly planted nor properly cultivated. The fields are poorly tilled, and the farmer usually delays transplanting until the last minute. The cultivation is carelessly done. An immense amount of leaf is lost by worms. This negligence in cultivation alone probably reduces the tobacco crop of the Cagayan Valley by one half. Only about one third of the crop

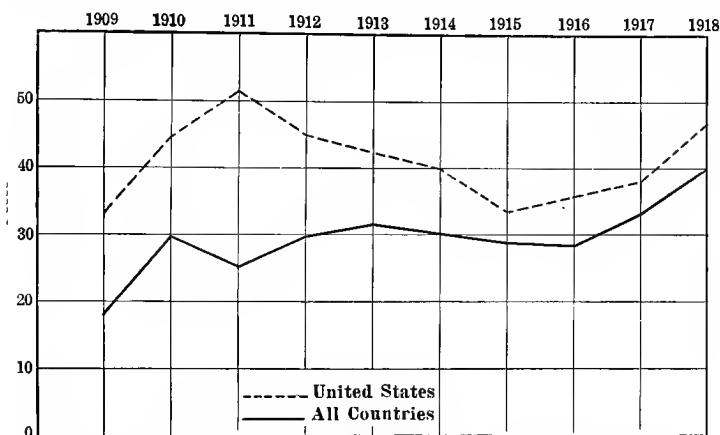


CHART XXV. PHILIPPINE CIGAR EXPORT; PRICE PER THOUSAND
Customs Statistics

is harvested at the proper time; the other two thirds of it is gathered when too green or too ripe. The process of curing tobacco in this region has been without doubt the worst that ever existed in any tobacco-producing country in the world.²

PLANS TO EFFECT IMPROVEMENT IN QUALITY

The excellent quality of Cagayan leaf is therefore not the result of careful cultivation and curing, but persists in spite of the slack methods used in producing it. The great market

¹ For details of planting, etc., see Miller's "Commercial Geography."

² From an unpublished report by Boltos Brewer.

for Philippine tobacco is that for cigars in the United States; this market demands a high-grade leaf. To bring about the production of such a leaf, however, is a complicated matter; for it involves some change in the system of selling on the part of small dealers, so that they may have an incentive to produce a higher grade of tobacco. Even under the strict rules of the monopoly it was impossible to counteract entirely the effect of the indolence and carelessness of the growers. They would not strive for superior excellence in cultivation, nor could they be made to understand the importance of attention to the details in curing.¹ Moreover, the monopoly was a failure on account of its abuses, and furnishes an example of what may result from government control of large productive enterprises. Hence any plan for improvement in the quality of Cagayan tobacco, if based on government control, must be considered a more or less dangerous one. It has been proposed to limit the amount of land cultivated and the number of plants grown by each farmer, and to supervise the various steps in cultivating, harvesting, and curing the tobacco by a system of government experts, who shall have authority to destroy tobacco which is not up to the standard. If carefully carried out, this plan might be a success, but its dangers are many.

Of the two possible remedies, government regulation and education, it is probable that the latter will bring about results more slowly, but that the results will be more extensive and more permanent. Such results will also be obtained with less friction and with less danger of abuse.

For several years the efforts of the government to improve the quality of tobacco in the Cagayan Valley have been in the way of instruction and example; in view of the difficulty of the situation some success has been attained. Experts travel through the tobacco region, study the conditions, give advice, and use their influence to introduce better methods.

¹ *Bulletin No. 58*, Bureau of Labor, Washington, D.C.

Seed cleaners are stationed in numerous localities, so that the farmers are able to obtain better seed, which means a superior product. Experiment stations are also included in this plan. Even schools have taken up the subject; oral instruction is given in the classroom, and school plots are cultivated under the direction of the teachers.

Act Number 2613, an Act to improve the methods of production and the quality of tobacco in the Philippines and to develop the export trade therein, is administered by the Bureau of Internal Revenue and by the Bureau of Agriculture.

Tobacco is placed under the jurisdiction of the Bureau of Agriculture from the time it is planted to the time it is harvested. The Act provides that the Bureau of Agriculture through its agents and inspectors shall purchase seed, clean it, and distribute it gratuitously among tobacco planters; that it shall be unlawful for any tobacco planter to cure leaf tobacco in any other manner than in a building or curing shed constructed in accordance with the specifications of the Bureau of Agriculture; that planters may be classified as first-class and second-class planters; and that the Director of Agriculture may grant diplomas to planters or producers for excellence in the production of tobacco.

The Collector of Internal Revenue has the power to establish general and local rules respecting the classification, marking, and packing of tobacco for domestic sale or for exportation to the United States. In general, the Bureau of Internal Revenue has charge of all tobacco after it is harvested, that is, while it is being cured and fermented, and until it is exported from the Islands, either in the form of cigars or in bales to the United States. The government inspection of cigars for the United States has already been explained, and the results have been noted. The Bureau of Internal Revenue inspects and classifies leaf tobacco also, (1) as to its origin (from Isabela, Cagayan, or other provinces), (2) as to length of leaf, (3) as to soundness, (4) as to use (that is, coloring and texture), (5) as to the standard for export (that is, four

classes for superior tobacco from the Cagayan Valley and three classes from other provinces).

This Act and its administration have tended to stabilize the tobacco industry in the Philippines, and to increase the quality of the leaf tobacco and of cigars exported to the United States.

SUGGESTIONS FOR REVIEW AND ORIGINAL WORK

SUGGESTIONS BASED ON THE TEXT

1. The reasons for forming the monopoly of tobacco. 2. Its rules and regulations and their effect. 3. Its abuses. 4. The effect of the abolition of the monopoly. 5. On what circumstance does the prosperity of the Philippine tobacco industry now depend?

6. Why the government controls the quality of tobacco leaf and of cigars for export to the United States, but not for other foreign markets, nor for the local markets. 7. The three markets for Philippine tobacco and its products. 8. The two forms in which tobacco is chiefly exported. 9. The form in which it is chiefly consumed locally.

10. Why the Isabela leaf is better than that grown in Union and Cebu. 11. The methods of growing and curing tobacco in the Cagayan Valley. 12. How these methods may be changed, and the quality of the tobacco improved. 13. The larger plantations and the small growers of tobacco in the Cagayan. 14. How the output of the small farms is marketed. 15. The problem of the quality of the Isabela leaf and the small producer. 16. How it is being met.

SUGGESTIONS FOR THE STUDY OF LOCAL CONDITIONS

In tobacco regions

1. A detailed report on the correct methods of tobacco culture and curing. 2. What the government is doing to increase the quality of tobacco (Act 2613). 3. Methods and procedures in grading Philippine tobacco.

In cigar-making centers

1. Methods and procedures in grading Philippine cigars for export and in controlling the quality of the product (Act 2613).
2. Cigar workers. 3. How cigars are made. 4. Grades and shapes.

**SUGGESTIONS FOR REPORTS FROM REFERENCES, ESPECIALLY
FROM COMMERCIAL GEOGRAPHIES**

1. The production and use of the world's tobacco crop. Illustrated with maps and charts. (Miller; Finch and Baker.) 2. The proper cultivation and curing of tobacco. 3. The world's commercial forms of tobacco. 4. Grades of tobacco. 5. Kinds of tobacco with respect to (a) source, (b) use. (Miller.)

6. From the latest "Statistics on Principal Crops of the Philippine Islands" prepare a chart representing the amount of tobacco produced in the Philippines. 7. Divide the chart into sections representing the production of the chief tobacco-producing provinces. 8. Compare these. 9. Using these data, and referring to Miller's "Commercial Geography" and Miller and Polley's "Intermediate Geography," prepare a map of the Philippines showing the regions producing tobacco for export and for local consumption.

10. Secure the necessary data from the latest annual report of the Collector of Customs, and bring Charts XXI, XXII, XXIV, XXV, down to the present. 11. Comment on these new figures.

12. Chart the total value of tobacco exports from the Philippines since 1899, and the amount exported to the United States.

13. From the latest annual report of the Collector of Customs, make a chart showing the export of leaf and stripped tobacco from the Philippines, and the principal countries to which it is sent.

14. Using data from the latest annual report of the Collector of Internal Revenue, make a chart representing the annual production of cigarettes, the local consumption, and the export.

15. Narcotics other than tobacco, such as opium, cocaine, buyo.

**SELECTIONS ON THE THEORY OF ECONOMICS TO BE APPLIED
TO THE MATERIAL IN THE CHAPTER**

1. Monopolies (Bullock, pages 167-180). 2. The difference between fiscal, financial, and natural monopolies.

CHAPTER IX

MINOR AND POSSIBLE EXPORT CROPS

Abaca, copra, sugar, and tobacco compose about nine tenths of the exports of the Philippine Islands. In this chapter we shall consider certain minor agricultural exports and certain other crops which, though grown but little in the Islands, could be produced in much larger quantities.

AGAVE FIBERS

Henequen¹ fiber has been known and used in Mexico for centuries. In 1783 its value for cordage was recognized; in 1830 a small quantity was shipped to Europe. Large production and export of that fiber, however, came about only when machinery had been invented to strip the fiber from the leaves at small cost. The machine used for this purpose was the result of a prize offered by the Mexican government. The low cost of obtaining the fiber then made it possible for henequen to compete successfully with other rope fibers, and caused large plantations to be started in Mexico. Various tropical and subtropical countries later established plantations with several species of agave, so that the amount of agave fiber now produced is very large. Improved machines and increased production have brought down the price, so that it is now profitable to grow agave only on large plantations where systematic cultivation, stripping, and

¹ The identity of the plants from which agave fibers are obtained has now been determined as follows:

sisal = *Agave sisalana* Perrinne;
henequen = *Agave fourcroydes* Lemaire;
maguey = *Agave cantala* Rox.

marketing make it possible to eliminate the waste. The day has passed when the small planter and stripper of agave fibers can normally make money.

Agave cantala, the species from which maguey fiber is obtained, was probably introduced into the Philippine Islands from Mexico; it is now found growing throughout the Archipelago. The possibility of raising it on poor soils, such as those found in Ilocos Norte, Cebu, Bohol, and other regions, caused large numbers of these plants to be set out several years ago when the price of agave fibers was comparatively high. In the meantime, however, the large sisal plantations in German East Africa and other countries came into bearing, and the price of these fibers fell. The scattered plantings of maguey in the Philippines do not warrant the use of stripping machines, since a continuous supply of leaves cannot be obtained, and transportation from scattered localities is expensive. In Java it has been proved that successful plantations must be well equipped with machinery, and must consist of about three hundred hectares with *cantala* as the chief crop, or a hundred and twenty-five hectares with *cantala* as the secondary crop.¹ Since no plantings of maguey in the Philippines approach this size, it is evident that the commercial production of maguey here is not usually profitable. Indeed, in most parts of the Islands, in normal years, either the maguey leaves are allowed to go to waste or the plants are grubbed up. The usual annual export, valued at about ₱1,000,000, comes chiefly from Ilocos Norte and Cebu, and is obtained by retting. The workers usually own the leaves; before the World War they got from the sale of the fiber the equivalent of only a fair wage.

The war prices of 1914 stimulated the stripping of maguey, and the export increased from about 7,000,000 kilos in 1915 to more than 14,000,000 kilos in 1917. This increased production was mostly the result of utilizing fields normally

¹ *Bulletin of the Imperial Institute*, London, Vol. X, No. 2, p. 301.

neglected. The value increased from about ₱1,000,000 to about ₱4,700,000. This excellent price revived interest in maguey. More plants were set out, and the question of machinery was again agitated.

In 1918 the amount of maguey exported from the Philippines was more than 11,000,000 kilos, valued at more than ₱3,700,000. Most of the export of 1917 went to the United States. In 1918 the United States took very little maguey from us; nearly all of it went to Great Britain. In 1917-1918 the average export price of maguey was about thirty-four centavos per kilo. With the end of the war and the dissolution of the Mexican Sisal Monopoly prices fell. For the first six months of 1919 only about 2,846,000 kilos of maguey were exported, at an average price of about twenty-five centavos per kilo. Many of the plantings of maguey were again abandoned, and the strippers turned to other industries.

Unless the production is regulated, therefore, the industry will not be able to compete with those of other countries, now that conditions in the world at large are becoming normal. It is probable that maguey will continue to be a minor export of the Philippines, and that most of the product will be sent to the United States, as it was during the war.

In parts of Cebu and Ilocos the plantations have been put on such a basis that machines have been successfully operated in much the same way as sugar centrals. There is room for such machines in certain localities where there are extensive plantings of maguey and good facilities for transportation to central points, at which stripping machinery can be established.

A small amount of sisal fiber also is exported, the product of plants imported from the Hawaiian Islands.

Maguey and sisal fibers are included in the fibers graded by the Bureau of Agriculture. The grades are now placed under three general types: maguey, or retted *Agave cantala*; cantala, or *Agave cantala*, cleaned by machinery or knives; and sisal.

KAPOK

Kapok trees grow throughout the Philippines. If the fiber from these trees were gathered, the aggregate amount would be considerable, but with the exception of Oriental Negros few of the provinces produce the fiber in commercial quantities. Java is the chief source of the kapok used in Europe and the United States.¹ Much of the Java fiber is obtained

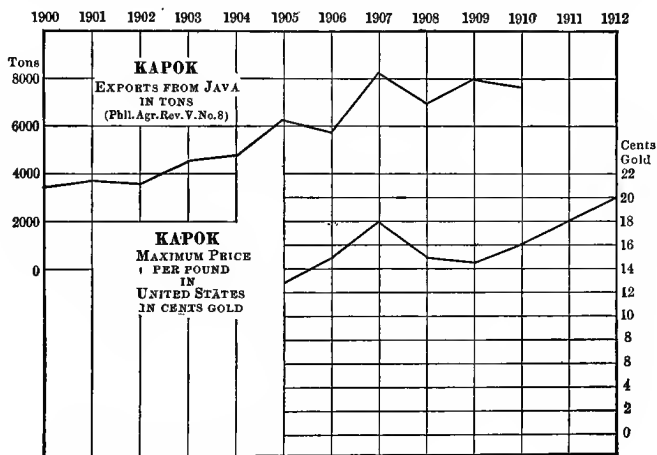


CHART XXVI

from trees planted along the roads, but regular plantations also exist. The amount of kapok exported from the Philippines is almost negligible in comparison with that from Java. In 1910 Java exported more than eight thousand tons. In 1910 the Philippines exported thirty tons, and in 1913 a hundred and thirty-four tons. If the pods from the kapok trees now existing in the Philippines were gathered, the present export could be increased many times without

¹ The growth and final establishment of this industry can be seen on Chart XXVI.

decreasing the amount used locally. Since the World War the export has decreased. It may revive again when freights become normal.

FRUITS

The position of fruits in the diet of the Filipinos has already been explained. The unsatisfied local demand for fruits would of course preclude export to foreign countries. There is only one considerable area in the Philippines which at the present time is economically dependent on fruit culture, and this is the orange district of Tanauan, in Batangas Province. But there are several fruits in the Philippines which could, either in their present variety or in an improved type, be produced in large quantities for both local use and export. With respect to foreign fruit markets two methods of disposing of the product may be considered, the export of canned fruit and the export of fresh fruit.

A good example of the former method is the pineapple-canning industry of the Hawaiian Islands, where a very large amount of capital is invested in canneries. The plantations on which the fruit is produced are extensive, and a large number of laborers are employed. Exports of fresh fruit require a market fairly close at hand. Some fruits, such as bananas, can be carried long distances if carefully picked and carefully packed. Others must be shipped in cold storage. An excellent example of successful fruit raising and export on a large scale is the orange industry of Southern California. In the latter part of the nineteenth century the attention of American horticulturists was attracted to the industry of citrous fruits, and superior varieties were introduced from other orange-producing countries. Most of the fruit grown in California is transported in special refrigerator cars; if it is to be carried by water, it is placed in the cold-storage compartments of steamers. California oranges are imported into the Philippines and even into Australia.

Of the fruits grown in the Philippines the pineapple would be the best suited for large canning operations. The variety grown is not so good as some that are now being introduced. In many regions of the Archipelago the conditions of soil and climate are well adapted to the pineapple, and plantations have already been started. The mango is also a fruit which lends itself well to canning and preserving.¹ Jelly for local consumption is now made from the Philippine guava. It is probable also that several other Philippine fruits will be found suitable for canning and preserving in commercial quantities.

A large market for Philippine bananas, mangos, chicos, lancesones, and citrous fruits could undoubtedly be developed in China and Japan, and for citrous fruits in Australia. A discussion of Philippine export markets for fresh fruit is more or less academic at the present time, on account of the lack of fruit to supply even local demand; but the subject is mentioned because of its possibilities if the production of fruit in the Islands is ever placed on a scientific and commercial basis. Through the introduction of varieties from abroad and selection from the seedlings at home, and through improved methods of cultivation, the standard excellence of the citrous fruits (orange, pomelo, mandarin, and lemon) will be raised. Citrous orchards cultivated on scientific principles and fruit handled properly could hardly fail to yield large returns on the investment; they would supply the local market with good fruit at lower prices than at present, and the business would ultimately develop into a considerable export trade.

The banana industries of Jamaica and Costa Rica, the two most important countries in this trade, are examples of results that can be obtained from systematic fruit culture. Jamaica now exports to the American and English markets about 12,000,000 bunches of bananas a year, and Costa Rica about 10,000,000. These are purchased from the growers on the spot at from thirty to sixty centavos a bunch; they are conveyed

¹ For a discussion of methods in canning, see Miller's "Commercial Geography."

by rail to the ports from which large steamers, specially constructed for this trade, transport them to the markets. Thus a bunch of bananas hanging in a New England store may have been taken from the plant in Costa Rica fifteen days before. The success of this industry has depended on the careful cultivation of the best varieties, and on systematic transportation and marketing.¹ Total shipments of bananas to the United States in 1911 were 44,660,000 bunches containing from eighty to two hundred bananas each, valued at ₱28,600,000. These were sold in the United States at about the price demanded for the better grade of bananas in Philippine cities. The number of vessels engaged in this trade is greater than the whole fleet of inter-island steamers in the Philippines.

RUBBER

Rubber originated in Central and South America and in Africa. From time to time it had received the attention of experimenters and merchants, but it was not until 1820 that anything practical was done with it. The modern rubber industry dates from the experiments of Goodyear, who found that a product impervious to water and not affected by extremes of temperature was obtained by combining rubber with sulphur at high temperatures. Later Mackintosh discovered the art of waterproofing cloth by means of dissolving rubber in naphtha. Since that time the demand for rubber has increased by leaps and bounds, as new uses have been found for it. The supply, however, has not kept pace with the demand. For many years rubber was obtained in a wild state in the Amazon Valley and in Africa; but the increased uses for it resulted in attempts to secure a more reliable source of supply, and experiments were made in cultivating plants which, in a wild state, yield rubber. Plantations were established in Mexico, Central America, the Malay Peninsula, Ceylon, and other countries. The high profits which these

¹ *National Geographic Magazine*, Vol. XIII, No. 7.

plantations realized caused great interest in the cultivation of rubber, accompanied by extensive speculation in the stock of the plantations. The shares were run far above their actual value, and the market broke. Since then the rubber-plantation industry has become more stable. At the prices before the World War the profits from cultivated rubber were large, though not nearly so large as those promised to speculators during the period of speculation.

The Philippines have also been interested in cultivated rubber, but only with the opening of Mindanao and Palawan have large areas suitable to the growing of rubber been available. It is true that throughout the other islands there are sheltered and suitable spots, where typhoons are not destructive, but the aggregate area of these spots is small compared with the amount of land available below the typhoon belt in Mindanao, Sulu, and Palawan. Not only are these latter regions free from winds which break the rubber plants, but they are not visited by drought or a dry season, which unfit central and western Luzon and the western coasts of the Visayas. The wild hogs in Mindanao, Sulu, and Palawan constitute a menace to the young trees, but these can be guarded against by strong fences. The existence of plantations there proves that the trees grow well. The chief difficulty now is to obtain sufficient labor, and this is deterring many from entering the industry. Although the Philippines are a producer of plantation rubber,¹ it is improbable that they will soon be an important factor, since the most favorable localities lack a supply of labor.

The situation has been complicated recently by the possibilities of synthetic rubber. One of the leading chemists of the world has stated that artificial rubber will soon be produced in commercial quantities below the present price of either

¹ See "Rubber-Growing Industry of the Philippines" and "Cost of Production and Products," by Dean C. Worcester, Secretary of the Interior, Government Printing Office, Washington, D. C. In 1918 the Islands exported 34,000 kilos of rubber, valued at ₱ 75,000.

wild or cultivated rubber. If this is accomplished, it may be that tropical rubber growing will come to the same end as the indigo industry, which was destroyed by the production of synthetic indigo in Germany.

SILK

The raising of silkworms¹ would seem a possible industry in the Philippines because the climate is suitable and food for the worms is easily produced. The mulberry on which the *Bombyx mori* feeds was introduced into the Philippines in 1593. From time to time interest has been taken in silk raising, and various persons and societies have endeavored to establish it in the Islands. The failure of these efforts has been due to lack of financial backing. Then, too, the agriculturists never lent themselves willingly to the growing of the silkworms on account of the great care demanded. From the year 1870 no attempts were made to introduce the silkworm until 1905, when the Bureau of Science at Manila took up the matter. There are now in the Philippines two kinds of worms: (1) *Bombyx mori*, feeding on the leaves of cultivated mulberry, and producing a cocoon which is reeled; (2) *Attacus ricinii*, the Eri silkworm, which lives on the leaves of the castor plant found growing wild throughout the Philippines, and which produces unreelable cocoons from which spun silk is made. Experiments made with these two worms warrant the statement that silk raising can be carried on in the Philippines under conditions as favorable as those which prevail in the best silk-producing countries of the world, with the added advantage that no disease has appeared among the insects here or on the trees used for feeding them. In countries about the Philippines diseases among the silkworms cause heavy losses. By law it is now forbidden to import silkworms, eggs, or cocoons into the Islands. The spread of the silk industry must take place under the supervision of the authorities, since

¹ See "Manual of Philippine Silk Culture," by Charles S. Banks, Bureau of Science, Manila.

inexperience or slovenly methods may lead to diseases. In several places in the Philippines both the schools and private persons have become interested, and it would seem that the industry has already been launched. Its growth must necessarily be slow. For many years to come a considerable amount of silk produced in the Philippines can be used in the local production of cloths such as jusi (made from raw silk), silks, and pongees. The United States furnishes a large market for both silk fiber and silk textiles, so that the Philippines already have an outlet for surplus production. They also have the benefit of free trade, whereas the product of other countries is subject to a high duty.

ESSENTIAL OILS

For many years there has been an export of ilang-ilang oil from the Philippines. Up to a few years ago the Islands were practically the only source of this oil; the high prices received for the flowers made their production extremely remunerative. At the present time such competition has developed in Mauritius and Madagascar that the price for the flowers has dropped from forty or fifty centavos to seven centavos per kilo.¹ It is improbable that the growing of ilang-ilang will again be so remunerative as formerly. There are several other Philippine plants which yield essential oils for perfumery. The world's market is constantly demanding new perfumes; *Michelia champaca* has been cultivated here with the hope that the high price will make its oil a remunerative minor export of the Philippines.²

COFFEE

The coffee plant was introduced into the Philippines by Spanish missionaries, late in the eighteenth century. By 1858 considerable quantities were produced, especially in the highlands of Batangas, Laguna, and Cavite provinces. In 1884

¹ *Journal of Science*, Vol. V, No. 4.

² For Philippine essential oils, see *Journal of Science*, Manila, Vols. IV, V.

the exportation of coffee exceeded ₱2,000,000 in value. In 1889 the Philippine industry was practically wiped out by the attacks of the fungus *Hemileia vastatrix*. Although the industry is now flourishing in some localities, such as Benguet and Bukidnon, and the production for the Islands as a whole is increasing slightly, it is improbable that coffee will soon be exported in commercial quantities. The possibility that the pest will again become active, and the sure returns from copra, sugar, abaca, tobacco, and minor export crops, are against coffee. The Philippines consume about 1,750,000 kilos of coffee a year, of which more than 1,000,000 kilos are imported, mostly from Hawaii and Java.

STARCHES

The production of cassava and sago in the Philippines has already been touched on with respect to the place of these plants in the diet of the Filipinos. As a source of flour, tapioca, and alcohol, cassava is an important crop. The export of tapioca from the Philippines is a possibility. Throughout the Visayas, and particularly in the Agusan Valley, the sago palm is found. In Borneo the starch from this palm is formed into pellets known as sago, and exported in large quantities. Extensive swamp lands suitable for sago palms exist in the Visayas and Mindanao. Among other plants which yield commercial starches, and which grow well in the Philippines, is the arrowroot.

OILS

The coconut is the principal oil seed produced in the Philippines. Several other oil seeds grow here, however, and are worthy of more careful attention for export. Among these are (1) the peanut, which is produced throughout the Islands for local consumption and for forage; (2) sesame, which is grown here and there in small quantities for local use, and which is, to some extent, already being exported; (3) the

castor-oil bean, inferior varieties of which are found in all parts of the Islands, the oil having become very important as a lubricant for aëroplanes; and (4) the candlenut, which is now gathered in commercial quantities in a few districts only, but which is being extensively planted by the Bureau of Forestry in reforested areas. In 1918 about 185,000 kilos of oil, valued at ₱130,000, were exported.

ESTABLISHED NEW CROPS

This enumeration does not include all present or possible export crops of the Philippines. Other export crops may result from the effort of large enterprises backed by either local or foreign capital. The present methods used in the production of the four chief export crops, and of the more important of the minor exports, do not warrant the introduction of new plants among Filipino cultivators. In the older and well-settled portions of the Islands more can be done by organizing the established industries on a firmer basis, and by improving the crops already grown, than by introducing new crops.

Nevertheless, diversification is a desirable condition in agriculture. It is a kind of insurance which eliminates the chance of a general disaster from the failure of any one important crop. It provides new crops, more or less tried out, to take the place of those no longer profitable. It is a phase of national agriculture that should be developed by government support and coöperation.

SUGGESTIONS FOR REVIEW AND ORIGINAL WORK

SUGGESTIONS BASED ON THE TEXT

1. The value of diversification in crops to the country; the locality; the individual. 2. Its limits. 3. History of the coffee industry in the Philippines as an example of what may occur to other commercial crops if pests are not controlled.

4. You have one hectare of fertile land, which you are urged to plant with maguey. Will you do so? 5. Suppose the land is

sandy and not valuable for another crop. 6. If you had a hundred hectares of such land, under what circumstances would you plant it with maguey? 7. What controls the price of maguey fiber in the Philippines? 8. Show how the price of abaca fiber is determined by much more direct causes. 9. Explain why the price of sisal fiber affects the price of Manila hemp. 10. Why do the lower grades of Manila hemp increase in price when there is a large crop of grain in North America? 11. From the history of the agave industry draw a comparison as to what would probably happen if successful stripping machinery were introduced into the abaca industry.

12. Uses of kapok, and the possibilities for its increased production for export.

13. Philippine fruits in relation to the possibility of growing them for export (*a*) in a fresh state; (*b*) preserved.

14. The banana industry of the West Indies and Central America. 15. Could a similar industry be developed in the Philippines? 16. Bananas versus abaca in the Philippines.

SUGGESTIONS FOR THE STUDY OF LOCAL CONDITIONS IN THE MAGUEY DISTRICTS

1. The government grading of maguey. 2. Maguey retting. 3. How a maguey central is managed.

4. Report on the feasibility of establishing a maguey central in a selected locality.

5. Possibility for maguey and kapok commercially. 6. The fiber plants of the locality (illustrated by specimens).

7. Local fruits in relation to local consumption and domestic trade. Possibilities. 8. New and possible agricultural crops.

SUGGESTIONS FOR REPORTS FROM REFERENCES, ESPECIALLY FROM COMMERCIAL GEOGRAPHIES

1. The relation between sugar, starches, and alcohol. 2. The chief sources of commercial starches. 3. Uses of starch. 4. Philippine starches.

5. Make and explain a chart of the uses of the Buri palm.

6. Clothing fibers of the world. 7. Where produced and used, illustrated with maps. (All commercial geographies.)

8. The processes in the manufacture of cloth. 9. Uses of cloth. 10. International trade in cloth. 11. Cloth imports into the Philippines. 12. The proportion of cotton-cloth imports to all imports. (Commercial geographies and customs reports.)

13. Cotton. (Miller; Finch and Baker; Toothaker; Bishop and Keller.)

14. The silk industry of the world. 15. Its relation to the mulberry. 16. The possibilities of silk production in the Philippines.

17. Abaca, banana, and pineapple fibers, and the cloths produced from them.

18. Hats. 19. The fibers used. 20. Felt, braided, and platted hats. 21. Localities of manufacture. 22. Trade in hats. 23. Philippine hats.

24. The production and uses of coir fiber. 25. Possibilities of producing coir fiber in the Philippines. 26. The manufacture of coir mats in the Philippines.

27. Philippine mats and matting.

28. Commercial brush and broom fibers. 29. Those grown and used in the Philippines. 30. Japan as a manufacturer of brushes and brooms.

31. How paper is manufactured. 32. Kinds of paper. 33. Paper materials. 34. Possible Philippine paper materials.

35. Some minor fibers used by the Filipinos. 36. Fibers that might be introduced and grown commercially in the Philippines. 37. Regions in which they are now grown. 38. Uses. 39. Trade.

40. Dyes in their relation to fibers. 41. Local dyes. 42. Mineral dyes. 43. History of the Philippine indigo industry.

44. The fruits of temperate and subtropical regions and the trade in them. 45. Import of fruits into the Philippines.

46. The production, consumption, and trade in the world's chief crops for beverages (coffee, tea, cacao), with maps and charts.

47. The production, import, and use in the Philippines. (Miller; Finch and Baker; and other commercial geographies.)

48. The chief commercial spices. 49. How and where they are produced. 50. Those produced, imported, and used in the Philippines. (Miller.)

51. The increasing uses of rubber. 52. The rubber-producing regions of the world and the trade in rubber, with maps and diagrams. (Bishop and Keller; Finch and Baker; and other commercial geographies.) 53. Philippine rubber regions. (Miller.)

CHAPTER X

LOCATION AND CHARACTER OF AGRICULTURE

THE SOIL

The rocks of the Philippines are chiefly of volcanic origin,¹ and much of the soil has been derived from their disintegration. In most cases it is a heavy red soil, exceedingly fertile on account of the minerals which it contains. It is much like the soils of the Hawaiian Islands, which also are of volcanic origin, and is well adapted to the growth of sugar, abaca, rubber, and the like. Large areas of the Philippines are covered with limestone, most of which is derived from coral. Residual soils of limestone formation are not very fertile, since the soluble part has been carried off by streams, and only the insoluble clay remains. However, the transported limestone soils, such as those found in the valleys and along the coastal plains near mountains covered with limestone, are exceptionally fertile. For instance, in Cebu the hillsides are not very fertile, whereas some of the best agricultural land in the Islands is to be found in the coves. Another fertile soil existing in the Philippines is that from the disintegration of the sandstone. Of the transported soils two are exceptionally important: (1) the fluvial soils found in the valleys, which are very rich, on account of their chemical composition and their finely divided and loose state; (2) a heavy, thick, grayish-blue soil, found at the base of many mountains and largely derived from rocks of volcanic origin, one of the best soils for rice growing.

¹ For a discussion of soils in the Philippines, see *Philippine Journal of Science*, Vol. V, No. 5, Sect. A.



ABACA AND COCONUTS ABOUT MAYON VOLCANO



RICE FIELDS ABOUT LAGUNA DE BAY
PHILIPPINE SOILS

CLIMATE

The average yearly rainfall in the Philippines is 2200 millimeters (88 inches); all regions have an annual rainfall of at least 900 millimeters (36 inches). However, some of the regions which have the highest annual rainfall receive it during only six months of the year. In the chapter on rice it has been shown that the long dry season which occurs in western and central Luzon, and on the western coast of certain other islands, is an important factor in limiting the rice to one crop annually; whereas on the eastern coasts the continuous rainfall makes two and even three crops possible. Not only are there fewer quickly maturing crops in regions subject to a dry season, but without irrigation it is impossible in these regions to grow plants which take a year or more to mature. Abaca, rubber, and such long-maturing crops are therefore confined to those localities which have a fairly continuous rainfall throughout the year.

Regions subject to heavy winds are not favorable to the growth of many plants. In the Philippines the best regions for abaca are those seldom or never visited by typhoons. Except in small, well-protected valleys rubber does not thrive in Luzon and neighboring islands, because of the destruction wrought by these violent storms. In the Batan Islands, on account of the typhoons to which those islands are subjected, certain roots have become the chief crops.

The effect of temperature on agriculture is of great importance, since for most products there are certain limits of temperature within which their growth is confined. Only a few agricultural products, such as corn and tobacco, have a wide range of growth in both temperate and tropical regions. A few other products of the temperate zone will grow in the tropics, but do not thrive there. Thus, the white potato will grow in the Philippines, but does not do well. Variation in temperature due to latitude is not great enough within the Philippines to create zones of agriculture. Mangosteens are strictly an equatorial fruit, and even in the Philippines are found only

in Sulu, Mindanao, and the southernmost part of the Visayan Islands; but other products may be grown in the lowlands from Cagayan to Sulu. On the other hand, variations in temperature due to differences in altitude greatly affect plant life here. In the lower levels are found swamp and tropical forests, the coconut, bamboo, rice, sugar, and other lowland growth. At slightly higher elevations coffee and citrous fruits thrive best. Above 1000 meters (3000 feet) the tropical forest of the Philippines gives way to pine; it is in this region that many fruits and vegetables characteristic of the temperate and subtropical regions can be grown. Only a few high peaks of the Islands are covered with typically temperate-zone growths such as the forests of scrub oak.

TRANSPORTATION FACILITIES

With people who live in so primitive a state as the Negritos, or even the Subanuns and mountain peoples, transportation facilities have little effect on the location of agricultural activities. The same may be said of families and groups among more advanced peoples who, through their own efforts, obtain from agriculture the products necessary for their existence. However, as soon as the commercial idea is applied to agriculture, and crops are grown for exchange, transportation becomes an important problem. In the Philippines the regions best suited to the cultivation of export crops are those along the coasts of the Islands, or those connected with the coasts by water transportation. With the advent of wheeled transportation plains and valleys have become important, since roads and railroads are constructed there rather cheaply.

In general, then, it may be stated that the location and the character of agricultural activities is influenced (1) by the fertility and composition of the soil; (2) by the amount and distribution of the rainfall; (3) by the temperature; (4) by the intensity of the winds; (5) by the natural transportation facilities.¹

¹ When agriculture becomes capitalistic, that is, when it is carried on by individuals and companies on a large scale requiring more than the

PHILIPPINE AGRICULTURAL REGIONS

The results of these influences on agriculture in the Philippines are noticeable. Along the coasts of nearly all the Islands are found plains of greater or less extent, most of which have a fairly uniform surface, and slope gradually toward the sea. Coastal plains are nearly always fertile, since they are covered with sedimentary or volcanic deposits. Moreover, transportation is usually easy both by land and by water. On the other hand, harbors bordering on coastal plains are apt to be few and poor. Most coastal plains were formed by the elevation of land masses, but most harbors are due to erosion and the sinking of land rather than to its upheaval. The most important coastal plains in the Philippines are those of the Ilocos provinces, Zambales, Mindoro Island, Antique Province, and Negros Island. But practically all the islands possess coastal plains of greater or less size, and even those found on the larger lakes, such as Laguna de Bay, are of importance. Because of their agricultural and transportation advantages, and because fishing can be carried on along their shores, the coastal plains of the Philippines are well populated in comparison with the interior regions.

Another type of Philippine agricultural region of great fertility is the plain formed by the upheaval of the Islands. The Central Plain of Luzon (the granary of the Philippines), the Plain of Leyte, the Central Plain of Panay, and the Cotabato Plain contain the largest continuous stretches of agricultural land in the Philippines. The soil brought down from the surrounding mountains often covers these plains to a considerable depth. In the Central Plain of Luzon, and in

labor of the owner and his family, two other considerations determine the location and character of agricultural activities: (6) the amount of labor available, and (7) the number of work animals and implements available, and the amount of machinery which exists or which can be acquired. The lack of sufficient labor has greatly influenced agriculture in Mindanao and other sparsely populated portions of the Philippines. The lack of work animals, of large agricultural machinery, and of modern sugar mills has retarded the growth of the sugar industry in Negros and other sugar regions.

CHIEF
AGRICULTURAL REGIONS

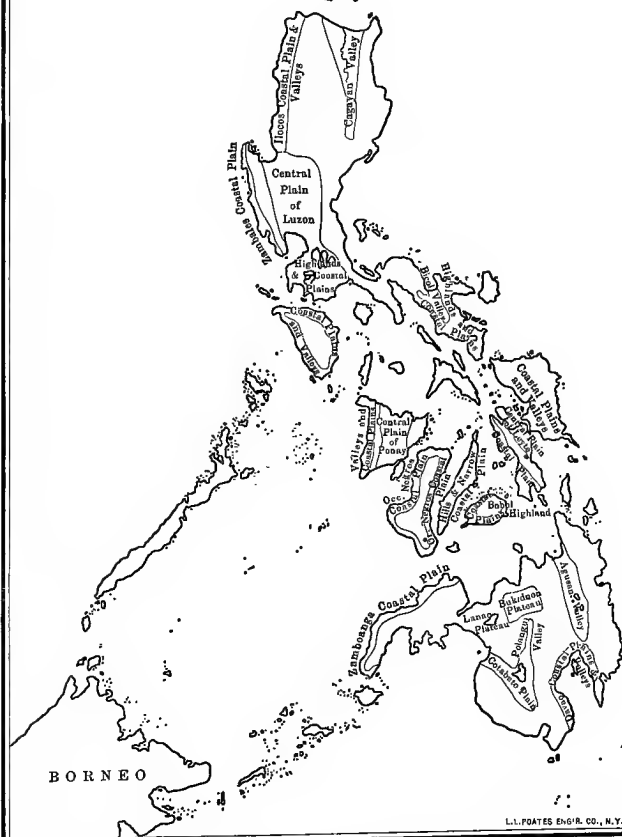


CHART XXVII. CHIEF PHILIPPINE AGRICULTURAL REGIONS

the Cotabato Plain, rivers offer cheap transportation, and road and railroad building is not difficult. Hence it is that these plains, so far as political conditions will permit, are among the richest and most densely populated regions in the Philippines. They are also the regions which offer greatest opportunity for agricultural expansion in the future.

Of Philippine valleys the Cagayan and Agusan are the most important, though many other small valleys, such as the Bicol and the Gandara, are very fertile. The population of the Philippines has not been dense enough to occupy more than the flood plains of these valleys. The great grassy stretches extending on each side are very fertile, but are harder to bring into and keep in cultivation than are the flood plains which annually receive sediment from overflows. In the Cagayan Valley the floods deposit from one to twenty-five millimeters of sediment on the flood plain every year. It is largely on account of the fertility thus added that tobacco of such good quality is continuously raised there. The rivers of these large valleys offer facilities for transportation, but the swift current which often characterizes them lessens their value for this purpose. The valleys are subject to worse floods than are the plains, though it is probable that the increased fertility produced by the deposits of silt more than compensates for the damage wrought.

Throughout the Philippines there are numerous small valleys lying in the mountains or opening out into the coastal plains. These furnish some of the richest land for small farming, but the difficulty in transporting the produce from them is usually so great that they are but sparsely settled. Many of them are not occupied at all.

Another type of fertile Philippine agricultural region is the highland, good examples of which are found in southwestern and southeastern Luzon. The soil is usually derived from disintegrated volcanic matter; its fertility and good drainage make it most suitable for such plants as the abaca and the coconut. These regions are sufficiently elevated for

the growth of coffee and other highland crops. The great drawback to these regions is the difficulty of transporting their products to the coasts, but this is now being overcome by the building of railroads.¹

Of plateaus Benguet and the Bukidnon are the most important in the Philippines. Were it not for the difficulties of transportation, the Bukidnon plateau would undoubtedly be a very rich region. The amount of arable land in Benguet is limited, but the transportation system now being developed will bring it into close connection with Manila.

Plateaus occupy a peculiar position in the tropics, since temperate-zone and subtropical crops can be grown on them. Both these plateaus, for instance, have furnished coffee to the lowlands for many years; Benguet will undoubtedly supply the Manila market with such temperate-zone products as berries and flowers.

A few of the hills and low mountains of the Philippines support a considerable population, such as those of Cebu (the most densely populated of the large islands of the Philippines), where thousands of people eke out an existence from the shallow limestone soil. The terraces of the mountains of northern Luzon have already been described. In other mountain regions agriculture takes the form of the kaingin system of clearings in the forest, such as those of the Subanuns.

SUGGESTIONS FOR REVIEW AND ORIGINAL WORK

SUGGESTIONS BASED ON THE TEXT

1. Tabulate the important agricultural regions of the Philippines according to the following classification: (*a*) inland plains; (*b*) great valleys; (*c*) coastal plains; (*d*) small valleys; (*e*) highlands; (*f*) plateaus; (*g*) mountains.

¹ This difficulty of transportation retarded the development of the highland regions of the Philippines, and the land remained unclaimed. As the result of recent settlement, land is now owned in small parcels. Hence these highland regions in the Philippines are usually very democratic, since nearly all persons are landholders, and wealth is rather evenly distributed. Many of these regions bid fair to develop into wealthy communities.

2. Tabulate the advantages and disadvantages of the regions included in each of these classifications as to (*a*) composition and fertility of the soil, (*b*) amount and distribution of rainfall and its effect, (*c*) temperature, (*d*) intensity of winds, (*e*) natural transportation facilities.

3. Locate a certain region of the Philippines that you think might be developed into an important agricultural region, and bring in a report covering its possibilities.

SUGGESTIONS FOR THE STUDY OF LOCAL CONDITIONS

1. Make a map of the province or locality showing (*a*) the soils, according to their formation, and according to the crops grown; (*b*) the means of transportation, indicating the areas well and poorly provided, and explaining the effect of transportation facilities on the character of the crops grown.

2. Philippine soils in their relation to crops.

SUGGESTIONS FOR REPORTS FROM REFERENCES

1. Climate of the Philippines in relation to the location of agriculture. (See Miller and Polley's "Intermediate Geography," and illustrate the discussion with a chart on which the distribution of rainfall in Tuguegarao, Candon, Calbayog, and Surigao are plotted.)

2. Philippine agricultural regions that depend for their prosperity on natural means of water transportation. 3. Explain how the improvement in these will increase the agricultural value of the region. 4. Philippine agricultural regions that have been or are being developed as the result of the building of roads and railroads, for example, Nueva Ecija, Northern Camarines, and southern Tayabas. 5. Using data from the census on the cultivated area by municipalities, prepare a map of the agricultural regions of the Philippines, and compare it with Chart XXVII.

SELECTIONS ON THE THEORY OF ECONOMICS TO BE APPLIED TO THE MATERIAL IN THE CHAPTER

Nature as a factor of production. (Bullock, pages 32-35.)

CHAPTER XI

DEVELOPMENT IN AGRICULTURE

Advances made in agriculture by primitive peoples are due to environment, necessity, chance, and observation, rather than to knowledge. Even among civilized peoples, who understand the use of the plow and other advanced agricultural implements, who practice crop rotation, fertilization of the soil, and selection of seed, development in agriculture has also been the result of environment, necessity, and observation, rather than of science. For instance, people of the United States have developed machinery for agricultural purposes because their problem has been to cultivate large areas with little labor. On the other hand, the people of many parts of Europe and of Asia obtain greater yields per hectare, since they understand more thoroughly the principles of intensive cultivation. Their problem has been to obtain the greatest possible yield to feed the large number of people.

CALAMITIES

The natural forces which bring about most calamities are usually too great for man to control, but he can so prepare himself for them as to recover quickly from their effects. Struggle with adverse conditions of nature has developed in him a vigor and resourcefulness which forms a valuable national asset.

Floods and high winds are the most common causes of calamities in the Philippines. Heavy rainfall at the headwaters of river valleys, such as the Cagayan, cause the streams to rise, sometimes far above their banks. Typhoons occasionally drive the sea a considerable distance inland,

causing the water of the rivers to overflow the land. The damage done by floods is usually the drowning of standing crops, the destruction of agricultural lands by changes in the river channels, injury to houses and agricultural implements, and the drowning of animals. Sea water is destructive both to crops and to soil. River water, however, is usually beneficial in the end; the overflow of the Cagayan River yearly enriches the soil of the flooded area; the amount of alluvial matter deposited by unusual floods often more than compensates for their damage. The damage may be prevented to a certain extent by so planting that the harvest comes before or after the floods usually occur.

Typhoons bring with them high winds. In the northern part of Luzon they are of annual occurrence, and are provided for in the character of the crops. In the central and southern parts of the Philippines typhoons are unusual, and their visitations are indeed calamities. Coconuts and abaca are the crops to which high winds are particularly injurious, and the effects of one storm may be felt for a long period of years. For instance, the injury done by the typhoon of 1908 to the yield of copra in Romblon lasted for more than five years.

Eruptions of volcanoes affect only a small area; but the destruction within this area is usually great. Mayon and Taal are the only volcanoes which have done any considerable damage within historic times. In 1754 Taal erupted from May to December; a large extent of cultivated land was destroyed by showers of ashes and mud, and by immense rainfall.¹ In 1911 another destructive eruption of Taal occurred, which killed hundreds of persons on the western side, covered the surrounding country with mud to a depth of from one to three feet, and destroyed or damaged the vegetation over a large area. The earthquake wave which the eruption caused was also destructive round the shores of the lake.² In 1897 the flow of lava from Mayon Volcano

¹ Census, 1903.

² See "The Eruption of Taal Volcano," Weather Bureau, 1911.

destroyed plantations and towns on its sides and base.¹ The rapidity with which volcanic ejecta decompose, however, and the richness of the soil thus formed, often compensate for the damage wrought to agricultural land and to property in general.

The effects of calamities do not last long in the Philippines; for both the soil and the people show remarkable recuperative powers. Secondary effects may, however, persist for some time. For example, the typhoons which swept Samar in 1908 so reduced the crops that the people were forced to look to some other means of living than agriculture. The large weaving industry of Basey, Samar, is one indirect result of these typhoons. The number of mats woven on Romblon Island has been much greater because of the decrease in the yield of coconuts caused by the typhoon of 1908.

DRY SEASONS, DROUGHTS, AND IRRIGATION

Droughts have not been discussed with other calamities, since, unlike them, their effects can be largely overcome. The regular annual period of drought, or dry season, which occurs for almost six months in central Luzon and the western parts of certain other islands, and for two or three months in parts of the Visayas, has already been discussed with respect to its influence on the number and character of the crops, and on the seasons of agricultural activity. Extraordinary droughts, however, also occur in the Philippines. Sometimes they affect only a very small area, but at long intervals the entire Archipelago is subject to unseasonable dry periods. Probably the most serious of these occurred in eight months of the season of 1911-1912. In June, July, and August there were numerous typhoons, bringing copious rains, and planting conditions were excellent. In the critical months for the rice crop, October, November, and December, there was almost a total lack

¹ See "La Erupeón del Volcán Mayón," by P. José Coronas, S. J., Manila, 1898.

of rain throughout the Islands and their vicinity.¹ This caused a large reduction in the rice crop. Corn, root crops, coconuts, abaca, and almost all the other crops were injured by the long period of dry weather.

If extraordinary droughts happen at planting time, they usually result only in delay and a late field crop. If a field crop has already been planted, drought may cause its destruction or a reduced yield. The yield of long-maturing crops, such as coconuts and abaca, is always affected by continued dry weather; abaca may even be destroyed by drought of long duration.

The effect of drought can be reduced by conserving the moisture in the ground. The method of accomplishing this is called dry farming. It has been highly developed in the United States on the dry plains of the Northwest. Certain regions there have only a small annual rainfall, which occurs during a very short period. When the rains are over, the crops are planted. Then they are frequently cultivated shallow, so that a layer of dust forms over the field. This dust mulch prevents the escape of moisture from the ground by evaporation, and conserves it for the use of the plants. It is probable that by this system certain field crops, such as millets and corn, could be grown in the Philippines during the ordinary period of the dry season, and that the yield of long-maturing crops could be increased. During periods of unusual drought dust mulching is of the utmost importance in keeping long-maturing plants alive. During the extreme drought of 1911-1912, for example, coconut groves which were cultivated shallow were little affected in their yield, but uncultivated groves decreased one half in the production of nuts. In Davao it is reported that the abaca stalks on an uncultivated plantation fell over from lack of moisture, but that on a neighboring plantation they were kept alive by shallow cultivation, which conserved the moisture. The

¹ See "The Extraordinary Drought in the Philippines, October, 1911, to May, 1912," Weather Bureau, Manila.

yield on the latter plantation was interrupted for only six months; on the former plantation no stripping could be done for more than two years. The cost of cultivation necessary to produce and maintain the soil mulch is so little that this method is generally practicable.

Soil mulch merely reduces the damage done by drought. The effect of long periods of dry weather can be wholly overcome only through irrigation. Even among such primitive peoples as the Bontoks and the Ifugaos we find that the value of irrigation is known, and that the more simple methods of accomplishing it are practiced. Irrigation for the production of crops was in use thousands of years before the Christian Era. In all parts of the world are found remnants of irrigation works, some of them of large size. Regions still exist wherein water is carried to the fields by human beings. Many devices, worked by human or animal power or by river currents, are used to raise water and spread it over the fields. Occasionally the topography of the land to be irrigated and the position of the streams is such that water can be diverted from rivers by dams. Small areas can be irrigated by means of pumps. In certain parts of the world the geological formation is such that good results are obtained from artesian wells; these are often used over a considerable area.

None of these methods, however, supplies a sufficient amount of water to be of great value, and with the exception of artesian wells all of them depend more or less directly on rainfall. Throughout the world reservoirs and irrigation systems are now being built to insure a constant supply of water, and to bring into cultivation lands which otherwise could not be used. Sometimes these structures owe their origin to private capital, but their great size and the number of interests involved often necessitate government ownership.

In India there are 18,000,000 hectares of land under irrigation. Of these 7,200,000 hectares are irrigated by government works.¹ Egypt has about 2,500,000 hectares under

¹ Robert Buston Buchley's "Irrigation Works of India."

irrigation, an area which supports a population of 5,000,000, in addition to the payment of an immense interest on the national debt. Cape Province, in South Africa, is wasting enough water to supply more than 1,000,000 hectares of land. There are also systems supplying water to about 200,000 hectares.¹ Australia supplies irrigating systems with water from artesian wells. The annual yield from these wells in the Murray River basin alone amounts to more than 750,000,000 cubic meters. These, with the other water supplies of that country, are under government control.²

The Filipinos have several primitive forms of irrigation. In a few places human treadmills, such as are found throughout the East, are seen. Sweeps are sometimes worked by human power to raise pails of water and empty them into irrigation ditches. Carabaos are often used to turn water wheels; but these wheels are sometimes turned by the force of the current. Temporary dams are frequently built to divert water from rivers. Pumps are being employed to a small extent. In the Central Plain of Luzon artesian wells are being used to irrigate small tracts.³ It is estimated that permanent systems of irrigation in the Islands supply water to about 50,000 hectares of land. These systems usually consist of permanent dams for diverting rivers, and of ditches for leading water to the fields. In a few places there are reservoirs.

Irrigation in the Philippines is of the most importance to rice; it has already been discussed in the chapter dealing with that cereal. The irrigation of sugar cane and other crops will generally be profitable. In regions subject to a dry season irrigation will result in the growing of more than one crop of rice or other cereal during the year, and will permit the introduction of long-maturing crops, such as abaca. In all regions,

¹ *Bulletin of the Imperial Institute*, June, 1912.

² *Review of Reviews*, XXXIV, 620.

³ These wells were originally sunk by the government to get a supply of potable and clean water. They are now found throughout the Philippines, but the best are in the Central Plain of Luzon, where the geological formation is favorable.

whether subject to a regular dry season or to an even distribution of rain throughout the year, irrigation will give greater stability to agriculture by making crops independent of rainfall.

Small irrigation systems may be built by the owners of large haciendas. Combinations of local capital may be sufficient to undertake the construction and maintenance of systems such as are found in Ilocos Norte, northern Tarlac, and Boac, in Marinduque. The general interest taken in irrigation is reflected in the claims filed for water rights, and in the litigation over them. Corporations and associations are building new irrigation systems of small size here and there in all parts of the Islands. From 1912 to 1917 about eight hundred projects were under consideration or construction.

However, almost all irrigation projects must depend on the initiative of the government. In the past few years the Bureau of Public Works has repaired several of the old irrigation systems, and greatly increased their efficiency. At the same time, however, the construction of new, large systems has received the greatest amount of attention.

In India the deciding question in determining what regions should first receive the aid of the government in the form of irrigation works has been, Will it pay? In the Philippines the officials have to consider the amount of land to be benefited and the cost per hectare, the attitude of the landowners toward the project, their ability to repay to the government the initial cost plus the running expenses, and the location of the project with respect to other projects of a similar sort. It is recognized that government works should be distributed throughout the Islands. The revised irrigation law provides for the collection of water rent and running expenses of the plant in the form of taxes, the water rent going into a fund for the repayment of the original cost. Since this repayment tax is spread over a term of years, the farmer is not seriously incommoded, since the total addition to his taxes is, in normal years, but a small part of the additional income received from a more abundant crop. Contrary

to the custom in many countries, notably India, the government expects no direct revenue from the irrigation systems which it builds. The funds expended are regarded as the money of the people devoted to the purpose of increasing the economic prosperity of the country.

Guided largely by these considerations, the officials in charge of the work are studying every inhabited region where the water supply and general topography seem favorable for irrigation. Thus projects in Cagayan and the Ilocos provinces are considered along with those of central and southern Luzon, Panay, and Leyte; even central Mindanao, especially the valley of the Cotabato River, has received a preliminary examination. In this way irrigable land amounting to about 485,000 hectares has been located.¹

The work is one naturally attended with many difficulties and disappointments. The contours of the land must be accurately determined, a task which may involve weeks or months of labor, often in the depth of the jungle. The rivers and streams of the region must be examined, and both the maximum and the minimum flow of water accurately measured. In the typhoon belt this is extremely important; for although money must not be wasted in excessively strong works, all construction must be strong enough to withstand the greatest possible strain, even if the rainfall which causes the strain may not come for a period of many years. Then, too, the composition of the strata beneath the dams and main canals must be carefully determined by test wells. The strata must be of a kind not only to support the weight of the dam, but to retain the water. This is of the utmost importance, since any system, however expensive, could be rendered useless by the excessive seepage of water, and the collapse of a dam could be brought about by the flow of underground waters.

The irrigation system on the friar lands of Cavite furnishes an example of a successful project. This system contains

¹*Philippine Agricultural Review*, Vol. V, No. 4, p. 178.

135 miles of ditches, 117 dams, and 12.5 miles of tunnels. These convey water to 21,000 hectares of land, which produce yearly about 1,000,000 cavans of rice. The product per hectare averages from two to four times that of the nonirrigated lands of the immediate vicinity.¹ The system of San Miguel, in Tarlac, irrigates 4000 hectares of land; that at Pilar, in Bataan, 1000 hectares. The projected Santa Barbara system, in Iloilo Province, will irrigate 4000 hectares, at an estimated total cost of ₱190 per hectare; it is proposed for construction as soon as legal requirements have been met. A large number of plans of smaller systems have been examined, and construction will begin as soon as conditions permit. These projects include nearly every province in the Islands.

Unfortunately the natural difficulties are not the only ones with which the engineers have to contend. In some cases a system has been surveyed and found practicable, only to be given up because of the opposition of the very farmers whom it was intended to benefit. Various reasons are given for this opposition, but it seems to be based on a fear of the annual taxes and the alienation of prior water rights. Such opposition can best be met by showing the benefits of the completed systems; it is dying out as new systems are put into operation in different sections. To be successful, any system under government control must be administered in a fair and just manner, as regards both the collection of dues and the distribution of the water. Only in this way can the superintendent win and retain the confidence and good will of the farmers with whom he has to deal.

Irrigation in the Philippines is of the greatest importance. It increases the food supply by increasing the number of crops, and gives stability to agriculture by insuring the production of full crops. In general, however, the possibilities for irrigation are still under investigation.

The activities of the Bureau of Public Works during 1918, as regards irrigation, were confined largely to the

¹ *Manila Times*, May 15, 1912.

maintenance of systems constructed by the government, the repair and improvement of systems in the Friar Lands Estates, and the surveys and preliminary field investigations of new projects. Six field parties were employed in making surveys: San José project, Province of Nueva Ecija; Laoag-Vintar project, Province of Ilocos Norte; Botolan project, Province of Zambales; Naic project, Province of Cavite; San Mateo project, Province of Rizal; Bulo River project, Province of Bulacan.

The area of land covered by these projects is approximately twenty-three thousand hectares. In addition to these surveys, which had been conducted under the supervision of the Central Office, other similar projects had also been investigated by the district engineers.

In the department which determines water rights there were filed, during the year 1918, a hundred and thirty-two applications for water rights, and a hundred and twenty-three statements of existing water rights.

Surveys and field investigations had been completed on the following systems of irrigation: Pansol Creek, Province of Bataan; Talisay River, Province of Bataan; Nayom River, Provinces of Zambales and Pangasinan; Sierra Bullones River, Province of Bohol; Bued River, Provinces of Pangasinan and La Union.

In addition to these there were six systems of which the surveys had been completed before 1918, but for which the priority had not yet been determined.

The surveys and field investigations of the following systems were to be made: Parasapas Creek, Province of Pangasinan; Nagsincaoan River, Province of Ilocos Sur; Ubbog Estero, Province of Ilocos Sur; Maitim River, Province of Laguna; Ange River, Province of Pampanga; Nasisi River, Province of Albay; Ynarihan River, Province of Camarines; Gugo Estero, Province of Tarlac; Buge Estero, Province of Tarlac.

The area of land affected by the above systems is approximately ten thousand hectares, with an approximate value of three million pesos.

PESTS

Crops are more or less subject to attack by pests. Some pests have little ill effect on the vitality of plants and the amount of yield. Others are very destructive. It is seldom that pests can be wholly exterminated, but most of them can be held in check, or the effects of their ravages lessened. A few of the methods used in connection with different pests may be mentioned:

1. The most obvious methods, and those used by primitive and civilized peoples alike, are the mechanical protections, such as scarecrows for birds, and fences for pigs. In some regions bands of tar or other substances are applied to the trunks of trees to prevent worms and insects from crawling up into the foliage.

2. Many pests may be killed by hand or by mechanical means. For instance, locusts are driven into ditches, and there exterminated; rats and other animals are caught in traps; tobacco worms are picked from the plants.

3. Poisons and insecticides are used throughout the world.

4. By careful study the breeding places of pests may be discovered; this knowledge offers an excellent method of control. The destruction of rubbish and dead trees protects coconut groves from the rhinoceros beetle and other beetles.

5. Sometimes certain forms of life destructive to pests are found. The increase of any insect would be very large if the natural restraints were removed. For instance, a single female of one of the commonest moths lays more than five hundred eggs. Two hundred of these may, under artificial conditions, become moths; these produce fifty thousand eggs. Of these again twenty thousand moths reach maturity and produce five million eggs. This is the rate of increase of

such insects living in captivity; it shows that the increase of one moth in three generations is equivalent to ten large and devastating swarms of caterpillars. In a wild state, however, insects do not multiply at this rapid rate, because of the checks imposed by climate, lack of food, and enemies. Heavy rains, wind, storms, and cool weather do much to check their multiplication. In regions where certain vegetation dies down for a part of the year, for example, during the dry season in parts of the Philippines, food is lacking for many insects. Enemies of pests include parasites, the predatory insects, birds, bats, and the like. When insects become abundant, these enemies attack them and reduce their number. Fungoid and bacterial diseases also kill insects, as they do men and domestic animals.

These natural checks tend to prevent a large ratio of increase; if sometimes they were not temporarily suspended, they would keep the relative numbers of insects constant. Thus nature regulates the multiplying of insects, except where man artificially changes conditions of life in one or more of the following ways: (1) by introducing new insect or animal life; (2) by modifying the climate through the destruction of forests or the construction of large artificial bodies of water; (3) by destroying insectivorous birds; (4) finally, and most important, by altering plant life through agriculture or forestry. For instance, breeding places for locusts have been greatly extended through the destruction of forests and the growth of cogon grass. .

In the Philippines nearly all the insect enemies of the crops are kept in check by natural causes. One of the most important enemies of a destructive insect is the fly which lays its eggs in the larvæ of the pest. On hatching out, the larvæ of the fly destroy the larvæ of the pest. Many pests in the Philippines are thus controlled by flies. When certain climatic conditions are favorable, there are extraordinary outbreaks in the spread of the rice caterpillar. The larvæ of

the flies seem to increase in like proportion, however, and thus no outbreak of this pest appears two years in succession.¹

6. Often one variety of a plant, more hardy and better able to withstand the attacks of pests, can be substituted for other varieties. For instance, the coffee industry of the Orient (including the Philippines) was practically destroyed by blight, which cannot be controlled below a certain altitude. Arabian coffee is most susceptible to this disease. On the other hand, other species of coffee, such as the Liberian, are more or less resistant to the blight. Hence such varieties and their hybrids are frequently planted instead of the Arabian.

7. Lessening the effect of pests by changing the season of planting is sometimes resorted to. An excellent example of this is afforded by the history of the cotton-boll weevil. These insects have found their way into the United States from Mexico; they have spread over half the total cotton region of the country. Although much has been done to control or destroy them, no parasite or other natural enemy has been discovered. They cannot be poisoned, and mechanical means of

¹ It is but natural that man should act on this knowledge of the destruction of insects by their enemies, and attempt to discover and introduce forms of life that will be destructive to pests. The most advanced agricultural countries have been lavish of money and labor in searching for such checks, but thus far they have met almost complete failure. The scale which attacked the orange groves in California was destroyed by a ladybug introduced from Australia, but this is an exceptional case, since the scale in question was also introduced from Australia. The inoculation of rats with virus produces an epidemic disease destructive to them. Large amounts of time and money have been spent in searching for a fungus which will exterminate locusts. The danger of introducing animal or vegetable life which will in turn become destructive to agriculture must be recognized. For instance, ferrets have been introduced to kill off rats, but are themselves very destructive to poultry. The gypsy moth was introduced into the New England States in connection with scientific study, and has already proved exceedingly destructive to the foliage of trees. Millions of dollars have been spent in attempts to eliminate this pest, and it is only with great difficulty kept in control. Rabbits were introduced into Australia for sport, but they multiplied so rapidly that they became one of the greatest sources of damage to many crops. (See H. Manwell-Lefray's "Indian Insect Pests," Calcutta, 1906, office of the Superintendent of Government Printing, India.)

killing them have failed. A study of their life history, however, has brought out the fact that they are comparatively few in number immediately after winter, but multiply rapidly during the warm weather. It had been the custom in Texas to plant cotton late. The plan now adopted is to plant early-ripening varieties, to secure a good crop before the army of weevils has nearly reached its maximum. The cotton field is then plowed up and burned, to kill as many weevils as possible. Thus a profitable crop of cotton is grown where, under old conditions, nine tenths of the normal crop was destroyed.¹ The boll weevil is found in the Philippines also.

The chief agricultural pests in the Philippines have already been mentioned in connection with crops for food and export. Rats are particularly destructive to rice. They may be held in check by traps, poison, or virus. The chief enemies of corn are weevils, which can be prevented by growing a hard variety of grain well covered by husk. Swarms of locusts sometimes appear in the Philippines, particularly after an extraordinary dry spell, such as that of 1911-1912, which is favorable for their growth. They are destructive to many crops, such as rice, sugar cane, corn, and coconuts. Although they are attacked by many predacious animals, insects, and fungi, they increase so rapidly that they can be destroyed only by mechanical means or by insecticides. In the Philippines they are driven into trenches and killed, or insecticides such as arsenic and kerosene are used. Locusts breed in grasslands; when the Philippines become more settled, they will probably disappear. In the meantime their occasional advent makes necessary not only the coöperation of the inhabitants of the regions affected, but the assistance of the government to annihilate the swarms of adults, and the young before they can fly. The control of coconut beetles by the destruction of their breeding places has already been discussed. The tobacco worms can be held in check by picking them from

¹ *Review of Reviews*, February, 1904, pp. 188-191.



A SWARM SETTLED ON CULTIVATED VEGETATION



EFFECT ON A CORNFIELD

Photo by Bureau of Agriculture

LOCUSTS

the plants, and by trapping the moths by light. In sparsely populated regions wild hogs and deer are destructive unless kept out of the fields by strong fences; they are particularly dangerous to the numerous new coconut plantations.

Only one important industry in the Philippines has been seriously affected by pests, and that is the coffee industry; in 1889 it was practically destroyed, but is again becoming important in certain highland regions. In general, it may be stated that, in view of the climate and the small amount of attention given to pests by the agriculturists, the destruction wrought by them is very small indeed. The natural checks hold most of them in control.

AGRICULTURAL MACHINERY

Civilized men have far outdistanced primitive tribes in cultivating the soil. The kaingin system among the Subanuns has already been discussed; it has been shown that these people cannot use the same land for a long series of crops, because their implements are too crude to work in hardened soil covered with grass. Moreover, they do not understand how to treat the soil to prevent it from hardening and to retard its exhaustion. Kaingin are also made by the Filipinos to a small extent. Many clearings of a permanent nature are also being made each year; for as population increases, new land must be brought into cultivation. In forests the undergrowth is cut down and burned, the large trees are felled, destroyed, or removed, and the stumps are pulled up, blown out by dynamite, or burned. The first crop planted is often corn. On the Manobo farm of Butuan it has been demonstrated that three years are required to clear forest land and put the heavy, clayey soil in condition for general crops. The cultivation of legumes and the use of green manure have met with great success in preparing the soil. Cogon grasslands are burned off, broken up four or five times with the plow, well harrowed, and planted. The grasslands of the Philippines

are best brought into cultivation by tractor or cable plows, which are able to tear the mass of roots apart.

The most primitive forms of agricultural implements are those used in the hack system, that is, the digging stick, the wooden shovel, and the hoe. Subanun and mountain peoples, as we have seen, have not advanced beyond this system. The Filipinos, however, employ the plow and the harrow almost entirely. Indeed, as has been seen in the rice industry, when carabaos and cattle are not available for pulling plows, agriculture languishes or stops. The Filipino plow and harrow are primitive, but are being gradually superseded by more advanced forms. The plow in its simplest form consists of a crooked limb of a tree pointed at one end. This crude, one-handed affair merely scratches the top of the soil. A cast-iron share and moldboard



PHILIPPINE PLOW AND HARROW

are now generally attached, and do fairly good work. The Philippine harrow is made of bamboo. It does not pulverize the ground thoroughly enough to produce a well-prepared soil.

Cultivation of crops in the Philippines is done by the primitive plow or by hand. Except in a few places where special machinery has been introduced, the crops are harvested by hand.

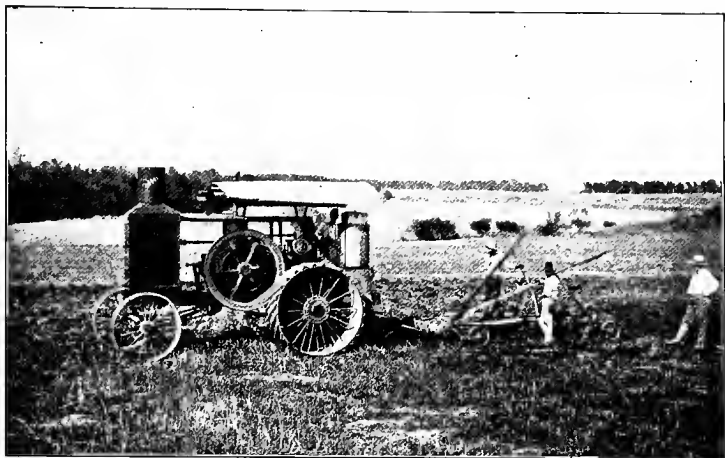
The invention or adaptation of machinery is not a simple matter; as mentioned in the discussion of rice machinery, it must be the product of experience. For instance, all the heavy

plows imported into the Philippines have proved unsuccessful; the lighter and smaller plows have given satisfaction, but are too expensive. Furthermore, the point at which the carabao is attached to the plow must be lower than that at which the American horse is hitched. Experience has proved that plow points and shares made of the iron from Angat, in Bulacan, give great satisfaction in most Philippine soil. From this composition of metal probably better plows can be made than those which are at present being imported into the Philippines.



A MODERN PLOW AT WORK

Until 1910 little had been accomplished in the introduction of more advanced agricultural machinery into the Philippines. Recently, however, much interest has been shown, and large and small machinery has been imported in considerable quantity. Much can be done in adapting such machinery to local conditions. The problems connected with agricultural machinery in the Philippines relate to two classes: small agricultural implements for small owners and small fields; large machinery adapted for use on sugar plantations and other large areas. For the small farmers a light general plow, a light



PLOWING WITH A GASOLINE TRACTION ENGINE, AN OLD AND GENERALLY UNSUCCESSFUL TYPE IN THE PHILIPPINES



A SMALL KEROSENE-BURNING TRACTOR THAT HAS PROVED SATISFACTORY IN THE PHILIPPINES ON SUGAR LANDS AND OTHER DRY LANDS

disk harrow, an iron smoothing harrow, one-row corn planters and drills, and two-shovel or three-shovel cultivators are necessary. These must be built to sell within the purchasing power of the small owner. For large sugar plantations and other estates power machines, both traction and cable, are required; these also must meet the local conditions of soil and cultivation.¹

REMEDIES FOR THE EXHAUSTION OF SOIL

The tendency of plants to exhaust the soil can be retarded or prevented in four ways:

1. Exhaustion may be retarded in certain instances by fallowing. This is practiced in the Philippines in the cultivation of sugar cane, where after the crop is gathered the land is allowed to remain idle. If only one crop is raised, and the fields are allowed to lie idle during the dry season, rice does not seem to exhaust the land. Cases may be cited where large areas have grown rice for at least a hundred years, and still produce crops without the use of fertilizer; this is probably due to the effect of the sun and air on the soil during the dry season. Nearly all the soils given to rice crack open when exposed to the air and the sun.²

2. The fertility of the soil may also be maintained by rotating certain crops. In temperate regions the rotation of crops has been carefully studied, but not much investigation has been made in the tropics. One authority,³ however, has suggested that such crops as yams (*ubi*, etc.) be planted the first year, corn the second, sweet potatoes (*camotes*) the third, and castor oil or some such crop the fourth. Sugar cane is frequently followed by beans and corn; rice is then planted and followed by beans and corn again; then comes a second crop of rice, after which sugar cane is again planted. An important effect of rotation is the resting of the various layers

¹ From information by the machinery expert, Bureau of Agriculture.

² *Bulletin No. 22*, Bureau of Agriculture, Manila.

³ H. A. Alford Nicholls in "Tropical Agriculture."

of soils, since the roots of different plants are sent down to different depths. In addition, a proper system of crop rotation prevents vegetable and animal pests. Although different crops are planted one after another in the Philippines, the idea of the planter is not to rest the soil, but rather to use the land as much as possible. In the Cagayan Valley tobacco and corn are rotated. In other districts rice alternates with sweet potatoes or other tubers.

3. Some plants, such as green gram and the cowpea, gather nitrogen with their roots, and leave it in the soil. Many times the plant is not used at all, but is cut off before it matures and turned into the soil. These crops are planted with or before starch crops, such as the potato, the growth of which is aided by the nitrogen thus left in the soil. This fact has been understood in the Philippines, and green gram is sometimes planted before a starch crop. The cowpea and manioc have been recommended as crops which can be planted together, the cowpea supplying the nitrogen needed by the manioc.¹ In the regions affected by the dry season, but provided with irrigation facilities, a crop rotation of corn with cowpeas between the rows, planted during the dry season and followed by two crops of rice, would probably be successful. Since the first period in the growth of rice occurs in seed beds, it is possible to accomplish this rotation within the space of one year.

4. Exhaustion of the soil may be prevented by adding fertilizers to it. Fertilizers are usually divided into two classes: (a) the general fertilizers, which include farmyard manure, ashes of the waste part of crops produced on the land, the waste products of towns, and the like; (b) special fertilizers, or artificial fertilizers, sometimes also called commercial fertilizers, which contain large quantities of nitrogen, phosphates, lime, and potash, in varying proportion, according to the crops. Special fertilizers are made from numerous products, such as guano, bones, oil cakes, slag, shells, gypsum, and many other

¹ *Journal of Science*, Vol. III, No. 2, Sect. A.

minerals. Unless these fertilizers are applied properly, however, they may do more harm than good.

On account of the abundance and cheapness of land in most places the Filipinos have never carefully studied the remedies for the exhaustion of the soil.

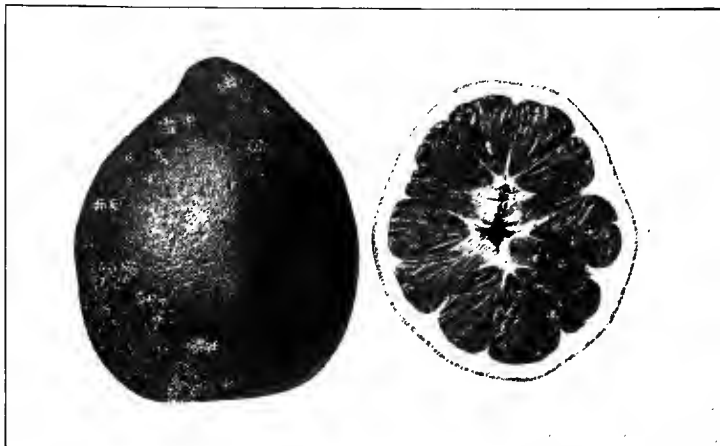
IMPROVEMENT IN CROPS

In the first chapter it has been seen that most Negritos now plant a few crops; that the Subanuns are fairly well advanced both in the number of plants grown and in the variety produced; and that the mountain peoples excel both these tribes in agriculture. It is a natural thing that man should eventually plant the roots and cereals which he primitively found and consumed in a wild state. When he has grasped the idea of agriculture, he increases the number and quality of his crops by importing new plants, and by breeding, cultivating, and selecting them.

Improvement in cultivation is illustrated by every crop now grown by man. Plants freed from the noxious effects of weeds, and cultivated in soil more or less carefully prepared, produce their fruit in larger proportions than when growing wild. Moreover, the greater the care exercised in cultivating the crop, the greater is its utility. The kernels of grains have increased in size and number over the wild grasses from which they came. Vegetables have increased in size and palatability. The size, color, and flavor of fruits have been improved, and the seeds of many of them have been reduced in size or even eliminated.

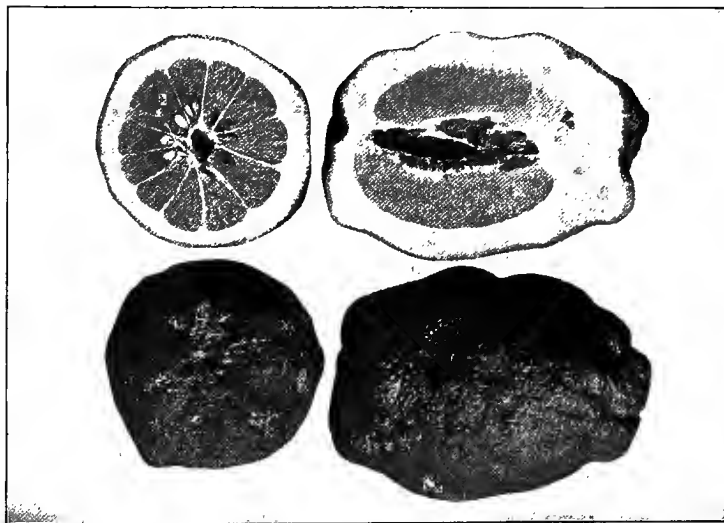
The tendency of plants to improve in favorable localities with careful cultivation is emphasized by selecting the seeds of the best plants for reproduction. Less advanced agricultural peoples usually practice seed selection unwittingly. According to Mr. Roy F. Barton, the excellence of rice in Ifugao is probably due in great part to the selection of seed.¹ In most

¹ Economic Report by Roy F. Barton, Ifugao.



AN EXCELLENT TYPE

Photo by Bureau of Agriculture



AN INFERIOR TYPE

Photo by Bureau of Agriculture

CITROUS FRUITS

districts the largest heads having the largest grains are carefully selected and bound into bundles for the next year's planting; this custom, however, is not due to any scientific knowledge on the part of the Ifugaos, but to a religious superstition, for they believe that if large grains from large heads are planted, the next year's crop will have large grains and large heads. Improvement by selection is understood and intelligently carried out only among the most advanced agricultural peoples. Thus varieties of wheat from the northern part of North America mature in much less time than those from the southern part; as has already been noted, the introduction of the quickly maturing northern cottons into Texas has partly solved the problem of the boll weevil. In the United States flax plants are grown for their seed, in Russia for their fiber. In many parts of the Philippines the pineapple plant is valued for its fiber rather than for its fruit. In the United States one variety of corn may be grown because it is rich in oil, another because it contains more starch in proportion to the other constituents. In the same way certain wheats are selected and grown for the macaroni trade, since these contain a larger proportion of gluten than the ordinary wheats.

In general, it is true that the Filipinos do not understand the improvement of plants by seed selection. On the contrary, selection in certain crops is often so made that the best plants are consumed or sold, the poorest being left to produce the seed for the next season's crop. Perhaps one exception should be noted, and that is the selection of the variety of rice. In a few localities the best varieties are always selected. After the drought of 1911-1912 early varieties were planted in many localities, so that the crop, being planted late, would mature more rapidly than usual. But, as has already been noted in the discussion of rice, it is seldom that any attempt is made to select the best heads in the field for raising the next season's crop. Probably every crop grown by Filipino agriculturists could be improved by selection.

It must not be thought that the great advance made in the varieties and types of plants has resulted only from selection in the fields. Certain men have made the evolution of new plants their life work; their results have been accomplished both by selection and by crossbreeding. Examples may be taken from almost every kind of agriculture. Two of importance to the Philippines are corn with ears well covered by the husk as a protection against weevils, and the hybrid coffees, which are more resistant to the coffee pest than the Arabian species.

DIVERSITY OF CROPS

The Philippines are an excellent example of a country where agriculture is largely dependent on foreign plants. We do not know what plants were brought into the Philippines before the arrival of the Spaniards, but the Europeans found already growing there rice, coconuts, sugar cane, yams, taro, bananas (including abaca), and several other plants of minor utility. Since that time tobacco, corn, maguey, cacao, coffee, the papaya, chico, guava, a great variety of vegetables, and several other minor economic plants have been introduced from Central America and other parts of the tropics. Even to-day new plants, such as the fruit called the roselle, are being brought into the Philippines. The introduction of plants was formerly due to the activities of merchants, travelers, or sea captains; but to-day governments and even private individuals send out agricultural explorers to search the world over for plants that will grow in certain soils and climates. Thus the agriculture of all advanced countries is becoming more and more diversified.

It must not be thought that diversity of production is synonymous with self-sufficiency. The policy which has for its aim the domestic production of all articles required by the family, the community, or the country is open to criticism. On the other hand, the policy which makes the agriculturist, the agricultural community, or the country dependent on one crop places

agriculture on an unstable basis, particularly in the tropics, where the amount of yield and the demand for certain agricultural products fluctuate so much. The history of commercial tropical agriculture seems to present a succession of rich crops. The uses of a certain tropical plant being recognized in Europe and America, its planting was begun in the tropics. A brisk demand for its product ensued, and good returns were realized. Then there was a rush to extend the plantings and to take advantage of the rising prices and large profits. Methods of planting and of producing the commodity exported received little attention. There was much waste from poor methods, and the land was not utilized to its full capacity because energy was concentrated on this one crop. Extensive rather than intensive methods were employed, but large profits were made by reason of the high prices obtained for the product.

But the turning point was always reached; then the industry was given up, or was placed on a stable basis, so that good profits might be made through careful methods of agriculture. Sugar of the West Indies is an example of an industry almost destroyed and later placed on a sound basis. Enormous profits were first made with crude methods; but as soon as economic methods and government aid produced sugar more cheaply from beets, the sugar industry was almost abandoned. It was renewed only by adopting improved methods from the beet-sugar industry. In Ceylon the profits in coffee were wiped out by a pest; later the Cinchona industry felt the effects of overproduction. The indigo plantations which for a time produced such large fortunes in the Ilocos provinces of the Philippines were made unprofitable by the production of synthetic indigo. The competition of sisal fiber helped to reduce the profits from abaca plantations, and will probably affect that industry seriously unless better methods are employed in the cultivation and stripping of abaca. Millions of coconuts are now being planted in the tropics. This is due to the high prices offered for copra. But the demand will sometime be supplied, and profits will then be made only from groves which are well

planted and cared for, and of which the product is carefully prepared. The small plantings of maguey are profitable in the Philippines when the price of agave fibers is high. With the increased production and low price, maguey is profitable only in large plantations where every advantage can be taken of the reduced cost of large production and of most advanced methods.

Since the Philippines produce export crops, they are dependent on foreign countries for a large portion of their food supply. The Islands import rice because large regions produce abaca fiber, copra, sugar, or tobacco for export, and take rice in exchange. Hence a short crop in southeastern Asia, or political unrest there, means a curtailment of the rice supply of the Philippines, high prices, and suffering among the poor. The ideal condition would be one in which the Philippines produce enough rice to supply local needs, raising and exporting products only in exchange for cotton goods, steel, luxuries, and other articles which cannot be produced here at all, or only at a much higher cost than that of imported goods.

It is interesting to note that Laguna Province was not much affected by the scarcity of food after the drought of 1911-1912 for the reason that the diversified products raised there insured the people against famine.¹ On the other hand, after the typhoon of 1898, which partially destroyed the copra and abaca of Masbate, the rice imports into Masbate diminished because the people had nothing left to exchange for rice.² This condition caused a considerable amount of suffering among them, and many had to take to the hills to find food. Another interesting example is that of the people of Cagayan. Jolo, who had depended almost entirely for their living on the exportation of copra and cattle, and had bought their rice from Palawan.³ In 1910 this source of supply was suddenly cut off; several trading boats were sent to the Palawan coasts,

¹ Economic report by R. G. McLeod.

² Economic report by James C. Scott.

³ Economic report by H. C. Stanton.

but returned empty. Hence, although the people had plenty of copra and cattle, they were unable to buy rice, and had to subsist on coconuts and a limited amount of wild roots found on the island. They immediately began to plant camotes and rice, but on account of their inexperience their first crop was practically a failure. The second, however, was much better; at present the possibility of a rice famine on Cagayan Jolo is remote. Another pertinent example may be taken from the abaca region of the Bicol Peninsula. If the occupants of the small abaca fields would plant food crops about their houses, instead of being dependent on abaca, they would be able to tide themselves over the times when the low price of hemp does not provide an adequate living. As it is, they abandon their fields when the price of hemp becomes so low that they cannot obtain a living by stripping it. In the two great crises of the hemp industry, namely, in 1911-1912 and 1919, the situation was complicated by an increase in the price of rice coincident with the decrease in the price of hemp. The planting of more food crops and of coconuts in the abaca regions would give greater stability to the hemp industry by making the people less dependent on it for existence.

It holds for the individual, the family, the community, and the country, that the safest and sanest condition of agriculture is one in which a sufficient amount of food is raised locally to provide for ordinary needs, and export crops are grown to exchange for products not necessary for existence. It is probable that the food crops raised in the Philippines could be increased to the point of supplying local demand without decreasing the amount of land devoted to export crops. The yield of rice and corn to the acre can be made larger, and much idle land can be brought into cultivation. The present difficulty of providing a domestic supply of food can be met not only by a general increase in the production of rice and corn, but by a greater utilization of small parcels of land in such crops as corn, sweet potatoes, beans, bananas, and garden vegetables, in patches for family or local consumption

supplementary to the staple food. Great progress has already been made, but there is still much to be done before the Islands can be economically independent so far as food is concerned. The experiences of 1919 and the food shortage indicate the dangerous condition of the Islands.

SUMMARY

The Philippines are not among the more advanced agricultural countries of the world. However, this is a situation not without hope. The farmers in what are now the advanced agricultural countries did not work out their problems by themselves alone. The greatest and most lasting results have been obtained from the study and experiments of expert agriculturists and scientists in different parts of the world, and have been carried to farmers by all the modern means of publicity, such as publications, lectures, and demonstrations.

Efforts for bettering agricultural conditions in the Philippines have extended over a period of several years. It is probable that advance in agriculture in the Islands will be slow, but with the education of the masses, and with the example set for them by agriculturists who have had special training or experience, adoption of modern methods will ultimately follow.

Like those of other countries, the farming districts in the Philippines differ in the character and the intelligence of their population. In the wealthiest and most progressive communities a considerable advance in agriculture has occurred in the last few years.

Three factors that are bringing about general improvement in agriculture warrant special mention. First, the prosperity of the Philippines in recent years has increased the purchasing power of the agriculturists and given them the funds necessary to improve their lands and purchase machinery. Many farmers have used to advantage their increased means. Secondly, the government control of grading tobacco and

abaca has encouraged better methods in these crops. Thirdly, special schools exercise an ever-widening influence on agriculture. By 1918 there had been established in the Islands twelve agricultural schools and fifteen farm schools, besides one hundred and twenty settlement farm schools.

SUGGESTIONS FOR REVIEW AND ORIGINAL WORK

SUGGESTIONS BASED ON THE TEXT

1. What are the chief problems connected with the improvement in agriculture in the Philippines? 2. Do these more closely resemble the development and problems of agriculture in the United States, or of agriculture in China and Japan? Explain. 3. Explain the conditions and factors which are now bringing about improvement in Philippine agriculture. 4. The relation of capital to development in agriculture (*a*) in large agricultural enterprises; (*b*) among small farmers.

5. Agricultural calamities in the Philippines. 6. How their effects may be mitigated. 7. How the government assists the victims.

8. The drought of 1912 was unfavorable to rice and favorable to sugar cane. Explain why. 9. You are the manager of a large sugar, coconut, or abaca plantation. A drought occurs. What steps might you take to save your crop?

10. Explain the value of irrigation in times of drought, with relation to water control and planting and harvesting; in the growing of more than one crop annually on the same piece of land; in the production of long-maturing crops.

11. Compare the extent of irrigated lands of India, Egypt, and the Philippines.

12. Private and government activities in the Philippines in building irrigation systems; what has been accomplished; future activities as planned.

13. Explain the methods of controlling pests. 14. List the problems of agricultural pests in the Philippines under these methods.

15. State the problems with respect to agricultural machinery in the Philippines.

16. From the history of the coffee, indigo, tobacco, sugar, and abaca industries select incidents showing the danger of depending on one crop. 17. How can this danger be guarded against?

17. The Governor of the Department of Mindanao and Sulu has advised hog drives on a large scale among the settlers who are too limited in their means to fence their places with woven wire. The idea of these drives is that the whole community shall engage in them for the purpose of exterminating or driving away as many wild hogs as possible, and to make of the occasion a fiesta. Comment on this plan.

18. Under the authority of the Administrative Code of the year 1917 the Director of Agriculture forbade the importation of fresh fruits, except bananas and pineapples, from certain foreign countries infested with the Mediterranean fruit fly, including Spain, France, Italy, Australia, and the Hawaiian Islands. Explain why the government took this precaution (United States Agricultural Year Book, 1917).

19. The following is an extract from a newspaper of July 13, 1919:

The economic situation of the province is reported to be the worst the people have ever experienced; hemp, the only product that gives the people a living is hardly bought, while rice, upon which the people depend, is quoted at an excessively high price.

How might the people of Sorsogon have averted this situation?

20. What steps do you suppose they took to provide themselves with food?

21. In spite of the stagnation of the hemp industry the Philippines as a whole were prosperous in 1919. Why? 22. Would they have been prosperous if the hemp industry had been stagnant in 1907? (See Chart XI.)

SUGGESTIONS FOR THE STUDY OF LOCAL CONDITIONS

1. The fundamental needs for improvement in agricultural methods in the locality. 2. Is any advance being made?

3. Special reports on local pests.

4. The citrus canker in its relation to the orange industry. (Where orange trees are important.)

5. Extension of the use of the modern plow on small farms.
6. How it has been brought about. 7. Details of its construction.
8. Results from its use.
9. Diversity of crops in the locality.
10. List of plants recently introduced into the locality.
11. Remedies applied to the exhaustion of the soil. 12. Improvements in crops noted.
13. If there is an area of land that you think capable of irrigation, bring in a report on the project, discussing such points as ownership of water rights; source of water, amount, reliability; proposed works; contour of the land, drainage; soils, crops; distribution of the water among landowners; water charges and payment of the cost and upkeep of the system.

SUGGESTIONS FOR REPORTS FROM REFERENCES

1. Go through current publications (including commercial geographies) and describe the different kinds of agricultural machinery found there.
2. How the industry of agricultural implements in the United States originated. 3. How it has been conducted. 4. Its relation to agriculture in America. 5. Its expansion into foreign countries.
6. During the World War the depletion of farm labor and work animals, and the necessity for increasing agricultural products, resulted in the successful application of the gasoline tractor to agriculture. These farm tractors are small and compact, and have been successful in the United States and Great Britain. The caterpillar tractors are adapted to moist and uneven ground. Bring in a report on the use of these small tractors in the Philippines; explain their special importance here in relation to the rinderpest and the scarcity of work animals.
7. Types of machinery that might be used in rice cultivation.
8. Improvement in the plow used in the Philippines.
9. The food supply of the United States. (Finch and Baker.)
10. The conservation of fertility in rice fields. 11. A study of methods used in China and Japan. 12. Intensive agriculture in Japan. 13. A study of the methods of food production in an overpopulated country. 14. Gardening in China. (King's "Farmers of Forty Centuries" may be consulted for all these topics.)

15. From some civic biology (such as Hodge and Dawson's) bring in a report on the economic importance of fungous diseases, illustrating it with examples from the Philippines.

16. In some biology (such as Hodge and Dawson's "Civic Biology") read carefully the material on the control of pests. Make an outline of the problems and apply them so far as possible to the Philippines, using examples.

17. Philippine birds in their economic relation to man. (Publications of the Bureau of Science will be of assistance on this subject.)

18. The control of dangerous agricultural pests by the Bureau of Agriculture under the authority of Acts 2515 and 1757.

19. In 1918 "Abaca heart rot" was found in Laguna and Cavite. It is thought to have originated in old, poorly cultivated patches of abaca. A quarantine was established, and experiments were undertaken for its control. Report on the history of this disease since that time.

20. The "pink disease" (fungous) was discovered in the Philippines in 1918. It had evidently been introduced on plants imported for experimental purposes. It attacks one hundred and seventy-five species of trees, many of them being fruit trees. Bring in a report on the course of this disease in the Philippines since 1918.

21. A comparison of the water resources of the United States and the Philippines. (Brigham, pages 180-201.)

22. Forests and their relation to water supply. 23. Deforestation and deserts. 24. Reforestation in Europe, America, China, the Philippines.

25. How water rights are secured and protected by Philippine laws.

SELECTION ON THE THEORY OF ECONOMICS TO BE APPLIED TO THE MATERIAL IN THE CHAPTER

Capital as a factor of production in agriculture. (Bullock, pages 45-48.)

CHAPTER XII

LAND TENURE

INTRODUCTION

The total land area of the Philippines is about 120,000 square miles, or 30,000,000 hectares.¹ It will be seen by referring to Chart XXVIII that one half of this area is forested and the other half open land. It is probable that all this area was once forested, and that not until the Malayan peoples came were kaingin and permanent clearings made which resulted in open lands. About one third of the original virgin forest remains; one sixth has grown up again in second-growth forest; about forty per cent is open grassland; and only ten per cent of the total area is now cultivated.²

The problems concerning tenure of Philippine agricultural lands fall under two considerations: (1) the size of parcels; and (2) the system of cultivation with respect to laborer, owner, and country.

SIZE OF PARCELS

Most primitive peoples have no conception of ownership of land; for they do not occupy a region permanently, and

¹ The following areas are given for comparison :

Cuba, 44,000 square miles	Japan, 175,000 square miles
Austria, 116,000 square miles	Chile, 291,000 square miles
Ecuador, 116,000 square miles	Mexico, 767,000 square miles
Philippine Islands, 120,000 square miles	India, 1,773,000 square miles
Great Britain, 121,000 square miles	United States, 3,567,000 square miles

² These estimates are from reports by the Bureau of Forestry. The Bureau of Agriculture estimates the area of cultivated land as 15 per cent of the total area. In many countries of Europe all available land is cultivated. Even in the United States, a comparatively new country, 46 per cent of the land is in farms, and 25 per cent of the land is improved. In Java 40 per cent of the land is cultivated.

often are not directly dependent on the land for food. However, as soon as a man brings a bit of land into cultivation, he appropriates it for himself. Most Negritos observe the right of the cultivator to the exclusive use of the land he has cleared, and some even place a value on such land. Among the Subanuns a kaingin is owned by the family that has cleared it, and the right to use it can be exchanged. Among advanced agricultural peoples improved land becomes the chief form of wealth. Rice terraces compose almost all the wealth of the mountain peoples of Luzon, among whom private ownership of land is recognized.

The areas cultivated by the Filipinos may be considered as divided into small parcels, parcels of medium size, and large parcels. The amount of land which a man with one work animal (carabao or ox) can cultivate is about one hectare (two

and a half acres). Any plot of land less than this may therefore be considered a small parcel. With the help of the whole family it is usually possible to cultivate a larger area than this, the amount varying from one to five hectares, according to the size of the family. Pieces of land which are more than five hectares in area are nearly always worked entirely or in part by persons other than the immediate family of the owner. Chart XXIX shows graphically the portions of the Philippines in which parcels of three sizes are most important.

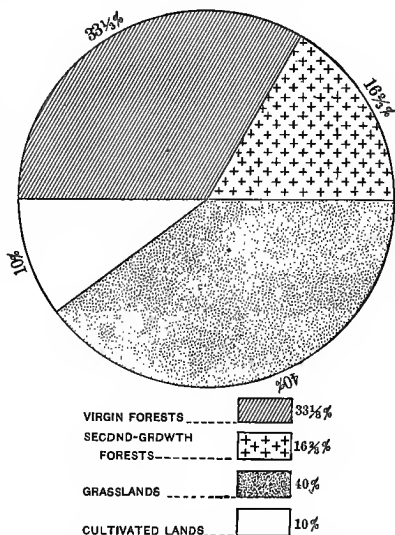


CHART XXVIII. COVERING OF THE PHILIPPINE LAND AREA

Estimates of Bureau of Forestry

It should be understood that there are parcels of land of all sizes everywhere in the Philippines. The map shows only the size of parcels into which most of the cultivated land of any given region is divided. The Philippine census of 1903 states that about half the parcels of occupied land are less than one hectare in area, and that a fifth of these are less than .01 hectare (.025 acre).¹ The average size of Philippine farms is given in the census as 3.5 hectares (8.5 acres), which means that parcels of less than one hectare predominate. Those of medium size (from one to five hectares) are next in importance, while of the larger parcels (of more than two hectares) there are comparatively few.²

Most of the land in the province of Albay is in holdings which are from one to five hectares in size. This province can therefore be taken as typical of the Philippines in general; the following figures, compiled by J. Q. A. Braden, Provincial Treasurer, show the averages for the Islands:

52.3 %, or 50,770 parcels, contain less than 1 hectare	52.3 %
23.9 %, or 23,201 parcels, contain 1 hectare but less than 2 hectares	42.65 %
10.55 %, or 10,242 parcels, contain 2 hectares but less than 3 hectares	
8.2 %, or 7,960 parcels, contain 3 hectares but less than 5 hectares	
3.5 %, or 3,300 parcels, contain 5 hectares but less than 10 hectares	5.05 %
1.55 %, or 1,602 parcels, contain ten hectares or more	
100 %	100 %

¹ Since the Philippines are a land of scattered holdings, the small plots mentioned are in the hands of a smaller number of owners than would at first be thought. The question of the distribution of land among the people is a different subject, and is taken up under the heading Systems of Cultivation, on page 226.

² It will be noted that the map gives these data with reference to the total area, whereas the census gives them in percentages of the total number of holdings. Parcels of land in France are of about the same size as in the Philippines. In the United States the average size of farms in 1910 was 55 hectares (138 acres), and the average amount of improved land in it 30 hectares (75 acres).

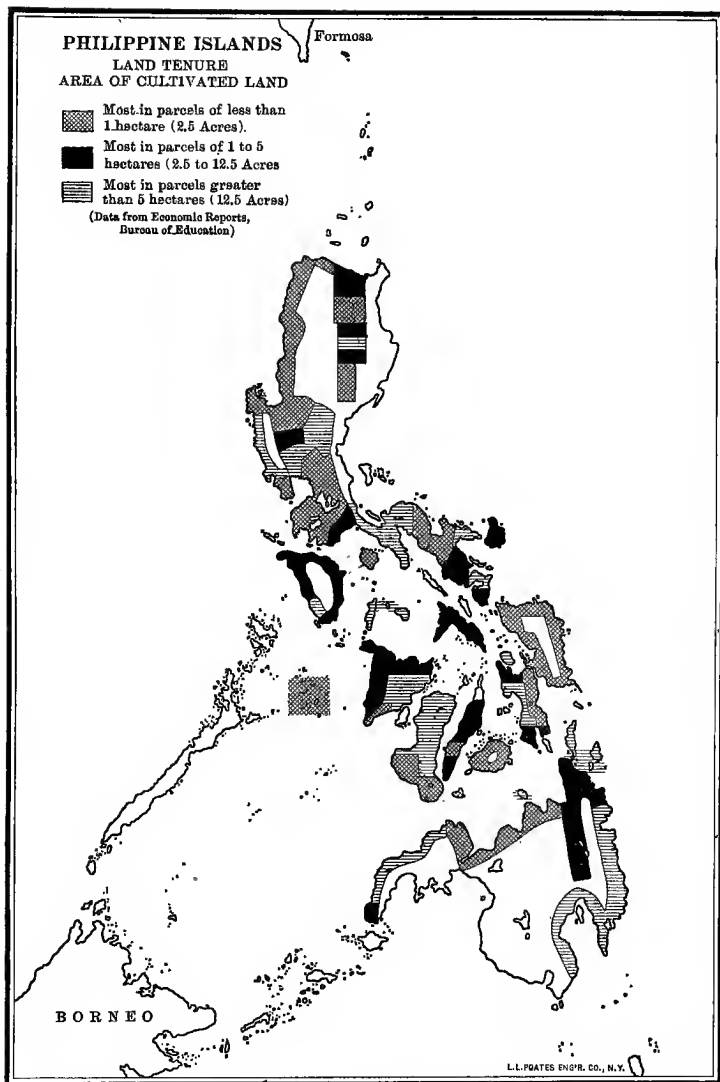


CHART XXIX. LAND TENURE: AREA OF CULTIVATED PLOTS

Ilocos Norte may be taken as an extreme example of the predominance of small holdings. As shown by the records of the provincial treasurer, 100,000 hectares of cultivated land are divided into 200,000 parcels, averaging a half hectare each. On the other hand, in parts of Negros and Iloilo three fourths of the land is in plots of more than ten hectares each.

The large parcels have in a few cases been handed down intact from early Philippine times. Many are the whole or parts of large Spanish land grants made from the public domain. Some estates have been formed gradually by purchase of contiguous smaller pieces. A few have more than 1000 hectares (2500 acres), many have from 100 to 500 hectares (from 250 to 1250 acres), while most have less than 100 hectares. In none of the larger estates is the whole of the arable land cultivated.

FORMATION OF SMALL AND MEDIUM PLOTS

The fields of medium size and the small plots are the result of several conditions:

1. The method of lowland rice culture, which necessitates dividing the land by dikes, results in small plots. Level strips of small area, but of varying elevation, are made, so that water from the canals will flow from the higher levels to the lower levels.
2. When land was plentiful, and was owned by virtue of tenancy and use alone, the settler cleared and claimed only as much as he could cultivate. The plots are of medium size. The manner in which the Philippine Islands were originally occupied is illustrated by the procedure of Ilocano immigrants in settling new country. They come in groups of from five to twenty, each group under a headman, who takes possession of a certain amount of public land. When this is cleared and put in a state suitable for cultivation, it is divided among the immigrants by the headman. Often several families who wish to migrate intrust their savings to one of their number, who buys land for their new homes. This land is distributed

among those constituting the community, but the title remains in the name of the headman.¹

3. Large parcels of land have been broken up through inheritance. The parents apportion them among the children, both male and female, and thus after several generations the plots become so small through division and redivision that they cannot be further subdivided. In this way it often happens that several persons will own an undivided interest in the same plot. In the more densely settled portions of the Ilocano country it is almost impossible to purchase even half a hectare of land that is not owned by from three to twelve persons.

4. It is with the greatest reluctance that the average Filipino parts with his land; but sometimes misfortune or need of money, occasioned by funeral, marriage, or other family event of importance, compels him to sell or mortgage a part of it. This land is seldom redeemed. Sometimes, induced by high prices offered by the tenants, the larger holders are persuaded to sell small pieces of their land.

The feeling which prompts the tenant to buy a piece of land long held by himself or family, and which makes the owner so loath to part with inherited holdings, accounts for the persistence as well as for the growth of small plots. The property of the wife is kept separate from that of the husband. Every parcel is divided among the heirs. Inherited property is so highly prized that owners do not care to sell it, even at three or four times what it is worth. The majority of landowners possess more than one small plot; but it never occurs to them to sell several of their small parcels to buy adjacent property, although they might be able to obtain the latter at from one half to one third of the original price.²

This desire for land (inborn, and the result of an aristocracy based on land ownership) is even now causing the extension of small holdings in most regions. It is true that in the most backward parts of the Islands the attitude of the people is

¹ From the economic report of Fred O. Freemyer, Pangasinan.

² From the economic report for Laguna Province, submitted by R. G. McLeod, Division Superintendent.

such that the condition of land tenure remains unchanged. Moreover, in a few localities where large parcels predominate, large proprietors are increasing their holdings; they buy those of the younger generation who prefer to sell and enter some other form of employment than agriculture, and those of the small proprietors who get into financial difficulties through ignorance or inability to handle their own affairs. But the Filipino share tenants are ambitious to own their plots, and the small proprietors to acquire further holdings. In most cases they fail to do this through ignorance and inability to manage their business; but those who succeed in establishing themselves as independent landowners, and in extending their holdings, are constantly increasing the number of small plots. This will be further discussed in considering the share tenant.

SYSTEMS OF CULTIVATION

The rights of a person in a piece of land are not always complete, and may change; customs, inheritance, law, or contract may limit them to a term of years, or to a certain amount of the product. These various rights will be best understood by a discussion of the systems by which land is cultivated.

The large parcels in the Philippines are cultivated by proprietary, share, or rent system. The small parcels may be cultivated by the peasant proprietors or by hired labor, or may be leased for a definite amount of money or of product, or on a share of the crop.

THE PROPRIETARY SYSTEM

In the proprietary system the owner superintends the affairs of his estate directly or through managers. The laborers work for a wage; they are supervised in small groups by foremen.

The Sugar Haciendas of Occidental Negros

The sugar haciendas of Occidental Negros offer the best example of the proprietary system, and will be discussed here. There are about four hundred sugar haciendas in that province,

the average amount of land cultivated on each varying from 100 hectares (250 acres) in some parts to 250 hectares (625 acres) in the San Carlos district. During the busy season an average of from one hundred to two hundred men are employed. Only about a fourth of these laborers reside permanently on the plantation; about three fourths of them are brought in, usually under contract, from the island of Panay and from the Bantayan Islands during the milling season, which extends from October through March.

The contract which the laborer makes with the owner or his managers is usually a verbal one, to work at a certain daily wage, the employer furnishing the transportation to his estate, and advancing money to pay the laborer's indebtedness at his home or the necessary amount for the support of his family while he is absent. Sometimes this agreement is made with a foreman who has taken a labor contract to cut and haul all the cane in a field. In any case the men work in squads or groups of from eight to thirty, with one foreman for each group. The foreman directs and disciplines the laborers, but in some cases questions may be referred to the overseers or manager. Families often accompany the married men. The women and children do the lighter work about the farm and may even clean and plant the cane points.

The laborers usually live in villages grouped about the owner's house, the permanent laborers in houses, the temporary ones often in barracklike structures which may be rather crowded during the milling season. Before the World War the wages given were keep and money, varying from ₱0.20 to ₱0.60 per day, according to the locality and the demand for labor. Since laborers seldom work continuously, the average amount earned each week is only from ₱1 to ₱2. Most of the money is spent in gambling at cards or in the cockpit, and some goes for clothing, food, and tuba; but the average workman takes part of his wages home with him. The laborers receive food from the manager while they are working. This consists of a ration of rice or corn with fish, usually dried;

occasionally, perhaps once a week, meat is included. As a rule, the permanent laborers are better housed and fed than the temporary ones. They sometimes have garden plots and a few chickens and pigs.

The relation between planter and laborer is only the business one of employer and employee. The planter tries to obtain the greatest possible results. Most of the laborers, however, are drawn from the class which, largely from ignorance, desires to work as little as possible for the wage, and to obtain as many advances as the planter can be persuaded to make.

The planter is expected at any time to advance money to his tenants up to two months' wages, to furnish medicine and to support the families during sickness, to get them out of trouble, to settle petty disputes and quarrels, and to give advice and counsel on all subjects. Custom generally concedes him the right to fine his men when necessary, to bring back men who have gone away owing him money, and to collect from the children the debt of a man who has died. The laborers do not leave for any action on the part of the planter if they think it just. The planter is deterred from the abuse of these powers by fear of losing his laborers.

The difficulties in the labor situation in Negros arise chiefly because the laborers belong to the least intelligent classes of the Filipinos, and are without any property or other interests which might give them the stability found among most Philippine agricultural laboring classes. Most of them are recruited from districts where sugar growing is practically unknown; often they do not understand even the first rudiments of agriculture. The cost of bringing a laborer from Panay may amount to twenty pesos. If, therefore, he works only a part of the time (he usually takes many intervals of rest) this amount of capital is lying idle. After pay day from thirty to fifty per cent of the men may be absent from work. It thus becomes necessary to maintain a force of a hundred men to have sixty working every day. The percentage of dishonest persons among the laborers is large, and on an average from five to ten

per cent break their contract, and leave the planter with only a debt in his possession. A planter of Negros annually loses in this manner from ₱50 to ₱1500, according to the number of men employed; in some districts the loss amounts to ten per cent of the annual expenditure for labor.

However, the planters also are to blame for the unfortunate situation. Many of them do not give enough personal attention to their farms, and as a whole they are making little effort to better the condition of their laborers. There is lack of coöperation among planters, who accept as laborers men known to have absconded from other employers, leaving their debts behind them. Then there has been little attempt to establish labor on a firmer basis by increasing the number of permanent laborers, by providing small garden plots, and by encouraging education. In general, planters have preferred to keep the men in debt, hoping thus to retain their services, and have not encouraged independent workers. It is noticeable that those few planters who provide good food and shelter for their laborers, and who treat them well and encourage schools, have the least trouble and are even able to obtain locally all the labor necessary. The adoption of modern methods permits planters to keep the permanent laborers, and to do away with the unsatisfactory migratory seasonal labor.¹

The Proprietary System in Other Provinces

The haciendas of Oriental Negros are similar to those just discussed, but many of the peasant proprietors (who predominate in that province) are available as laborers during the rush season.²

The proportion of permanent laborers on the sugar haciendas is much greater in Iloilo than in Negros. All extra labor

¹ Agricultural labor is discussed in Chapter XIII.

² Much of the information concerning the haciendas of Negros was derived from the reports of Eugene H. Rabun, C. A. Harbaugh, Martin S. Jones, and Roscoe L. Hall, supervising teachers.

needed during the milling season can be obtained locally in Iloilo, and the labor troubles are of much less importance than in Negros.

Rice, corn, abaca, and sugar are produced on the haciendas of Leyte. Many laborers live permanently on the land; but a large number are brought annually from Cebu. Little difficulty is encountered with labor by planters of long experience. Great care is exercised in establishing the estates, and only good workers are allowed to settle on the farms, those who do poorly being weeded out. However, some trouble is had with transient laborers who go away owing money.

The abaca haciendas of the Bicol Peninsula are worked on a somewhat different plan, since abaca is usually stripped on shares. Most of the laborers live permanently on the haciendas, and are often assigned a small patch of ground on which vegetables, bananas, and the like can be grown. Tenants sometimes leave the haciendas when the landlords try to discourage the maintenance of these plots. The wage of a laborer stripping on shares varies, according to the amount of fiber he obtains and the market price, from one half to two thirds. In some places a ration valued at one tenth of a peso for every arroba of hemp stripped is also given. The laborer's share must usually be sold to the owner of the land. Sometimes the owner furnishes fiestas during the year. The temporary laborers on an abaca plantation are few; they are often better off than the permanent laborers, since they have small parcels of their own. The foremen have the general supervision of the strippers, weigh the abaca, and so on. The laborer must often transport the clean fiber to the selling place. He has also to cut weeds from the fields, and set out new plants. Laborers on the hacienda of Sorsogon break their contracts, but to a much less extent than in the Visayas. Another troublesome habit of the laborers is stealing and selling hemp. There is also a tendency among them to work a few days and idle away the rest of the time. This is particularly true where the people are not interested in garden plots or in small holdings.

In parts of the Cagayan Valley, particularly in Isabela Province, exists a mixed form of the proprietary share system. Tobacco is the staple crop. The laborers are assigned permanent plots, and receive two thirds of the crop. In addition they obtain the entire product of the cornfields; before the World War they received from ₱0.25 to ₱0.40 a day for any work which was not connected with their crop. They are supervised by foremen, and usually sell their share to the owner of the land.

Forms of the proprietary system exist in other provinces also.

New Plantations

Many new haciendas have lately been established in the Philippines for the cultivation of abaca, sugar, rubber, coconuts, pineapples, and other crops. About the Gulf of Davao are several abaca plantations which are cultivated by hired labor, and stripped on shares. Most of the labor is permanent, but a considerable portion is floating. The largest sugar plantation in the Islands is that in Mindoro, on which modern methods are employed. The laborers have been brought in and settled permanently in villages. They are well treated; and it is reported that little difficulty is had with them. On the large sugar haciendas now established in Laguna Province thirty-five per cent of the laborers live permanently on the land; the others are brought in from the surrounding villages. They received, before the World War, their keep and from ₱0.50 to ₱0.60 a day. In general the new plantations are being worked on the proprietary system, with labor permanently established on the land.

PEASANT PROPRIETORS

In several sections of the Philippines the greater part of the land is tilled by the men who own it. Such localities are, first, those in which there is much new land, or in which much unoccupied land is found, such as Nueva Vizcaya

Province, parts of Isabela and Cagayan provinces, the lumbering regions of Bataan Province, parts of Tayabas Province, Butuan and Palawan provinces, and parts of Mindanao; secondly, regions long settled, in which the cultivation of the land by peasant proprietors has come about from the wide distribution of wealth, such as parts of Tarlac, Pampanga, Laguna, Batangas, Cavite, and Camarines provinces, Albay, Sorsogon, and Antique provinces, parts of Capiz and Leyte provinces, Oriental Negros, Bohol, and Misamis provinces.

There are other regions in which the land is owned by the tillers of the soil. These are not given in Chart XXX, but a comparison of that chart with Chart XXIX will show them. They are Ilocos Norte, Ilocos Sur, and Pangasinan provinces; much of Bulacan and Bataan provinces; parts of Rizal, Cavite, and Batangas provinces; parts of the Bicol provinces; and parts of Cebu and Leyte provinces. In these regions the interleaving share system predominates (page 256).

In all parts of the Islands there are also peasant proprietors, who own and till a greater or less portion of the land.

The number of plots, their size, and the area of total holdings of the peasant proprietors vary. In general the plots of larger size occur in the more recently settled regions or in those having much unoccupied land. In such districts the cultivator usually owns one plot, from one to five hectares (2.5 to 12.5 acres) in area, according to the requirements of tobacco, rice, corn, sugar, coconuts, and abaca. In well-settled regions the peasant proprietor often owns several small plots, sometimes as many as ten or more, but usually about three. The total area of these may be considerably less than is necessary to yield the proprietor a living, in which case he leases more land on shares; or it may be larger than he can cultivate, in which case he lets other persons cultivate some of the plots on shares. Usually the plots of one owner are separated, often by several kilometers, so that peasant proprietors in general lose much time in going to and from their

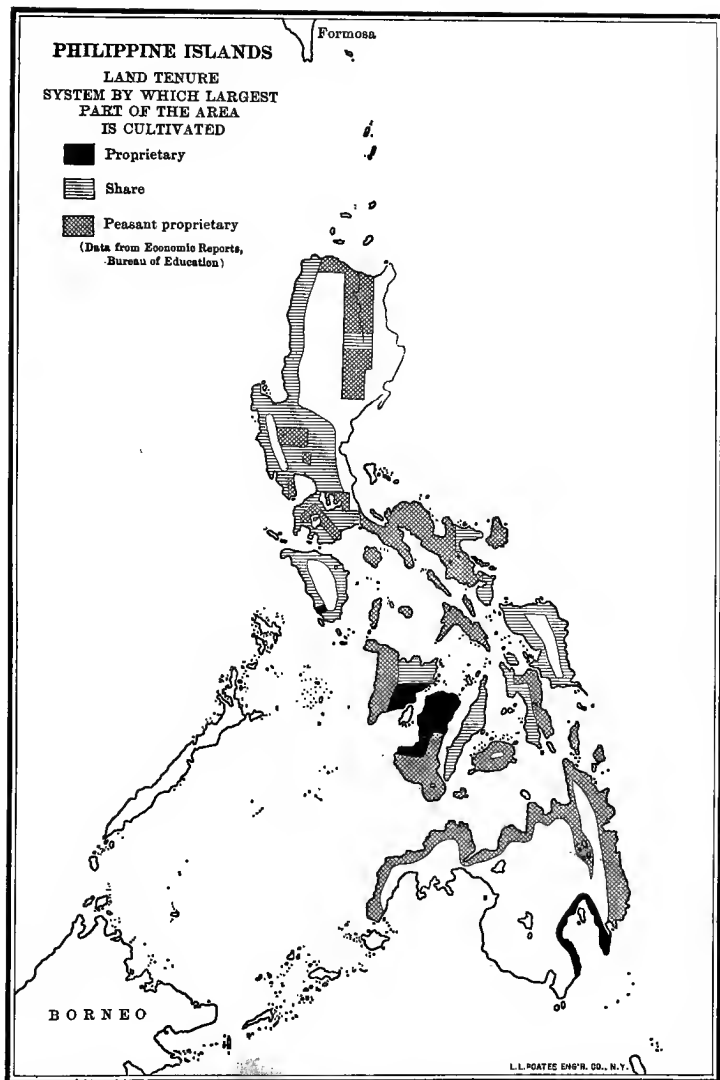


**CHART XXX. LAND TENURE: SYSTEM BY WHICH LARGEST PART OF
 DIFFERENT AREAS IS CULTIVATED**

fields; they are also compelled to spend a great deal of extra energy in keeping each of their little plots fenced, watered, and free from weeds.

The condition of the Philippine peasant proprietor is better than that of any other tiller of the soil in the Islands. His position is more stable; for he owns property which protects his creditors from loss. He is not often an habitual gambler or a permanent borrower. His intelligence is greater than that of hired or share laborers, since his self-reliance and initiative are more developed. His income is greater because he obtains the total crop from the land he works. The total annual income of peasant proprietors expressed in money was estimated by the economic reports at from ₱100 to ₱500 with the average about ₱250. Nearly all this is spent for food, clothing, and shelter. In some places the remainder is devoted to amusements and luxuries; in others it is habitually saved by the peasant proprietors. The Ilocanos are able to save from five to ten per cent of their annual income; they invest their savings either by purchasing work animals to cultivate their land or by purchasing land to increase their present holdings.

The income of the peasant proprietor is seldom wholly derived from agriculture. During the off season he may find employment on a neighboring hacienda, harvesting sugar, stripping abaca, or working in the coconut groves. At the time of harvesting rice he and his family may reap rice on shares. He may be a porter, driver, fisherman, lumberman, or wandering merchant. Often the women of the household greatly increase the family income by keeping small shops, by weaving cloths, hats, mats, baskets, slippers, and the like, or by making pottery, embroidery, and other products in the home. Some of these products of their industry find a ready domestic use within the household; but most of them are sent to the market.¹

¹ For a discussion of the relation between agriculture and household manufacture, see Chapter XVII.

*Small Owners who cultivate their Plots with Hired Labor, or
who rent them*

In most parts of the Philippines few or no owners of small plots cultivate them with hired labor; in the Visayas, however, there are regions in which that system is common. Several thousand plots are cultivated by hired labor on Panay, Negros, Samar, Leyte, and Cebu islands. In Tayabas Province and the Bicol Peninsula hired labor is employed on small coconut and abaca holdings. Small owners frequently rent their plots to cultivators.

Small owners usually interest themselves in remunerative occupations. Those who retain a few of their fields often work harder and cultivate them better than their tenants. Some occupy government positions or are employees of large companies; some are fishermen; some interest themselves in commerce, and become storekeepers or wandering merchants; some are day laborers, especially on public works; others are carpenters or barbers; many are teachers; among the Ilocanos and in Capiz Province and elsewhere they often devote themselves entirely to handicraft work in the homes. However, some small owners are satisfied with the meager income they obtain by renting their plots or by working them with hired labor, and set themselves up as petty landlords. In a few regions these men and the small owners who lease their land on shares constitute a large idle population.

THE RENT SYSTEM

In the proprietary and peasant proprietary systems the owners till the soil or supervise the work, and are the only persons directly interested in the crop. They have the whole right to the use of the soil, since they own the land in fee simple.

Sometimes cultivators obtain a temporary right to the total product of the land by paying a stipulated sum of money or amount of product; that is, they rent the land outright. This

system is one much practiced in Europe and the United States. In the Philippines it is employed to no great extent, although it is growing in favor in certain districts.¹

In most provinces land is rented directly to the cultivator at prices ranging from three to twenty pesos a hectare for rice soils. In Isabela Province tobacco land rents for from thirty-five to a hundred pesos a hectare, according to the fertility of the soil and the number of carabaos included.² The payment of a definite amount of palay at harvest time is an even more common form of rental, and ranges from one to twelve cavans of palay a hectare (or the same numbers of cavans for every cavan planted). The amount of rent depends on the fertility of the soil and the nearness to the village or town; it is usually one third of the crop. The renter furnishes his own carabao. The rental system is found in Isabela Province, in the Central Plain of Luzon, and in Zambales, Rizal, Laguna, Batangas, Mindoro, Panay, and Leyte provinces. In Zambales rent in kind is the system most used, but the form of control by the landlord approaches that of the kasama system. In parts of Bulacan as much as fifty per cent, and in Rizal Province in the zacate fields near Manila twenty-five per cent, of the land is rented outright.³ In Laguna it is known as the Busian system.⁴ In this system the rent is a fixed charge against the renter. If the crop fails, he is usually given possession of the land for another year, so that he may pay off the debt to the landlord. In Zambales advances of palay and money at high rates of interest are made, as in the kasama system.

¹ In Pampanga the large landowners rent tracts of considerable area to tenants, who in turn become landlords by subleasing the parcel to other tenants. The rent in this case is usually money. (From the economic report submitted by Mrs. Lois Stewart Osborn.) In Iloilo the sugar land is sometimes rented for cash at approximately eight pesos a hectare, this rental including the use of the mill and all the buildings on the land. Such large rented areas are worked by either the proprietary or the share system.

² Reports of Walter K. Perret and Horatio Smith.

³ From economic report of Fred T. Lawrence.

⁴ Reports of M. M. Boney and R. G. McLeod.

SHARE SYSTEMS

In the three systems just described the possessor of the land is the only person directly interested in the amount of the crop. A large part of the cultivated area of the Philippines is leased on shares, by an arrangement in which the owner of the land and the tiller of the soil are different persons, but both are directly interested in the amount of the crop. In some regions and under certain circumstances the share tenants are comparatively free in action; in others they are to a greater or less extent under the direction and supervision of the landlord, not only in matters pertaining to the tilling of the soil, but in family and everyday affairs.

The Manorial System

The manorial system approaches that which existed in Europe at the time of the Spanish conquest of the Philippines.

We can best understand the mediæval manor by picturing to ourselves the economic life of a whole village as a unit with the manor house its central point.¹

The whole of the cultivated land then fell into two species: demesne land, land cultivated entirely for the benefit of the lord, which might consist of a separate enclosed portion, or of holdings scattered among the holdings of the villagers, or both; and land held in villeinage, that is, land held from the lord by his tenants, who were unfree, and were bound to pay certain services to the lord. The amount of land owned by each tenant, and the services due to the lord, depended on his status. Two main classes can be distinguished: the ordinary holding was a virgate or yardland, usually thirty acres (12 hectares), held in scattered strips; the holder of a virgate was called a villein. Next came the bordars or cotters, the general size of whose holding was one or two acres ($\frac{2}{3}$ to $\frac{4}{5}$ hectare) though it sometimes rose to five acres (2 hectares) or more. These did not possess either oxen or a plough, and were in a decidedly lower position than the villeins. Both villeins and cotters were unfree, but their position was not that of slaves; a slave is bound to his master; his servitude is personal, he is destitute of rights, he may be called on to do anything. . . . But the villeins and cotters were

¹ Buecher's "Industrial Evolution," p. 103.

territorial serfs, bound to the land to perform certain fixed services, and they were not destitute of rights, in general opinion at any rate; how far these rights could be enforced by law was another matter.

Services were paid in labor on the lord's demesne, and out of the very great variety of them two main classes emerge: "week work," that is, labor for certain days a week regularly all the year round, villeins generally giving three days' work and cotters two; and "boon work," extra labor in addition to the week work at times of the year when there was special need for it; such boon work would be demanded at harvest, haymaking, and ploughing. In addition to week work and boon work there were often small tributes or payments in kind; fowls and eggs, bushels of oats, and so forth; and the villagers had to do what cartage the lord required. These duties discharged, the tenant had the rest of his time to work on his own holding.

It is evident that the principal task in managing an estate was to see that the villeins and other tenants paid their services duly, and to superintend them at their work. Such work when ill looked after would tend to be little, for the laborer had no inducement to work hard, and in the case of the boon work, the villein had every incentive to evade or put off fulfillment of his duty. . . . Whether an estate was valuable or not mainly depended on the amount of labor available. Fertility would be undeveloped, size would merely prove cumbrous, if there was a want of labor. There was no class of laborers who could be hired; a lord must depend on the services of his tenants. Thus pains were taken to keep up the labor on an estate. It was, generally speaking, impossible for a man on it to leave it; heavy fines were asked before permission was given. New holdings could easily be bestowed out of the waste, or existing ones divided if more land was required. But above all, when the aim of good management was that each manor should be self-sufficing, that the customary labor should be enough and no money disbursed to hire more, it was important to have an exact account of the labor on each estate. To know this was to know the value of the manor.¹

The manorial system is most closely approached in parts of Mindanao. There the tenant has the use of a certain piece of land allotted to him by the owner. The product of the land is his own, to do with as he likes. No rent is paid, but the tenant is obliged to work for the landlord a certain part of the time, for which he receives wages. It is the custom for the tenant to work every second week for the landlord. If the

¹ George Townsend Warner's "Landmarks in English Industrial History."

two have a disagreement, the landlord must purchase whatever permanent crops the tenant may have planted, before the latter leaves.¹ There are isolated cases of the landlord's receiving the entire crop from a certain part of the land cultivated by the tenant, the latter taking the crop from the remainder.

On certain haciendas on Negros Island part of the land is tilled by share tenants, who often have to work two days a week (dagyao) for the landlord. Formerly this service was given without extra compensation, but now daily wages are paid.²

The Kasama Share System

The two methods above are local in occurrence. In most cases land is leased on a share of the crop. The regions in which the greatest area of the land is worked by share systems is shown on Chart XXX. In general the relation of the tenant to the landlord and the conditions of both have brought about share systems of three kinds:

1. Large haciendas cultivated on the share system: the *kasama*, *kanan*, or *inquilino system*.

2. A large number of scattered plots owned by one person and leased to tenants: the *scattered-holdings system*.

3. Leasing and re-leasing by peasant proprietors: the *interleaving system*.

The kasama system is found on nearly all the large holdings in the Central Plain of Luzon, in Zambales, and in the Cagayan Valley (see Charts XXIX and XXX). It is also found to some extent in most other parts of the Islands.

The owner of a large share estate may or may not give personal attention to his land. He either lives on the farm and closely supervises the tenants, or he lives in town and interests himself in other things. In the latter case he may have a manager, who is to be considered the landlord in this discussion, or his tenants may take care of themselves in a

¹ From the report of M. A. Maxey, Baganga District, Moro.

² From the report of H. E. Carmichael.

disorganized manner. It is only the supervised, or organized, estates that will be taken up for discussion.

On most of the organized haciendas worked on the share system the landlord has a considerable amount of jurisdiction over the affairs of the tenant. He determines the crop to be planted, the time of planting and harvesting, and such matters as pertain directly to the cultivation of the plot assigned to the tenant. The relation between landlord and tenant in private affairs depends largely on the custom of the community, the character of the individual landlord, and the class to which the tenant belongs. The more closely the tenant resembles the laborer described in the proprietary system, the greater is the control of the landlord over his actions. In the *kasama* system as it exists in the Central Plain of Luzon the landlord exercises his control most effectively, and the tenant is correspondingly dependent.

*A Typical Kasama System.*¹ The owner furnishes the tenant with land, a carabao, and seed, the product of the crop to be equally divided between them after deducting the seed. Upon delivery to the tenant of the animal he takes "bugnos," advance money. This varies from ₱15 to ₱70 and forms a retainer, as it were, until the owner sees fit to release him and his family. The money itself he generally spends for his womenkind, and the remainder at the cockpit, which is his natural depravity, but his only pleasure in a life of hopeless drudgery. Naturally, as he lives from hand to mouth, he is without resources, except cooking pots, a mat or so, and a few clothes. At the end of the week, usually on Sunday, he draws a ration of palay from the owner, which varies, though usually a half cavan a week is sufficient for his family. This amount he pays back in kind with no increase, upon gathering his crop. But all other supplies of money that are generally drawn from time to time from the owner are paid for in "takalanan"; that is, at the end of the season the tenant repays the landlord in palay at less than market value, say at from ₱0.50 to ₱0.75 a cavan, a gain to the owner of from 150 to 200 per cent.

¹ This is an extract from an unpublished report, "Circle for the Study of Social and Economic Conditions in the Philippines," a synopsis of notes on the *kasama* system as found in Nueva Ecija, by Percy A. Hill, issued by the Committee on the Prosecution of Investigation and Publication, Manila, 1909. Mr. Hill is a planter in Nueva Ecija.

When the land, for the proper and timely preparation of which the tenant is held rigidly responsible, is once prepared, the seed rice or other crop is distributed in the fields awaiting transplanting. This part of the work is sometimes paid in total by the owner, the tenant doing the harvesting at his own expense; but the general custom is for the owner and the tenant to pay halves, the tenant naturally taking the money from the owner, paying the same rate of interest as the "takalanan," which swells his debt. The planters receive commonly from ₱0.15 to ₱0.25 a day with rations, and if the tenant has in his family anybody who can plant rice, he naturally reduces the price of his share of the planting.

The crop once planted, the ration of palay is usually discontinued; but the family has to exist, and so a new schedule is put into force, that of "terkiaan," 50 per cent increase, or "takipan," 100 per cent increase, so that if a tenant receives 5 cavans between planting and harvest he must pay back $7\frac{1}{2}$ cavans if "terkiaan," or 10 cavans if "takipan." After stacking in February, threshing commences, usually with carabao or cattle. The winnowing of the grain is generally done by the tenant's womenkind, who receive four per cent for their work. The crop is now ready for division; first the seed is deducted and the crop is halved; out of the tenant's half is deducted for the owner his total amount taken in rations, his "takalanan" and "takipan." Generally all he has left is an increased debt and the four per cent received by the women for winnowing; however, he manages to exist until the cropping commences again, when he resumes his ration and debt.

On large farms and haciendas years often pass without a "patuid," or settlement, and the tenant never knows whether he owes ₱50 or ₱100; thus, practically not only his work is demanded, but that of his wife and children, until they are old enough to enter as tenants, or until death passes the debt on to the younger generation. Their lives are a continual round of work and drudgery, the owner generally finding something to be done at all times.

The tenant's food consists of rice and vegetables, which he raises himself, generally camotes, corn, beans, and greens, varied by fish caught in the rice fields during the wet months, and by an occasional piece of meat. On this meager diet he works day in and day out, his only pleasure being tobacco and an occasional drink of "bino." As a rule, he uses two suits of clothes and one hat a year, a total value of about ₱5. A large family usually swells the debt. If he gets despondent, he has his former owner transfer him and his debt to another. He owns no land, nor property, as a rule, and his house is a "cubo" or hut of light materials, put together in two or three days. Of course his condition often varies. An old "kasama" often lives as well and as content as the owner, and at the present time an increasing number are

acquiring animals of their own and hunting up homesteads or leased lands, but many who obtain an animal fall into debt again.

The average charges against a tenant and family of three persons, estimated from observation and experience, are as follows:

Plow, and other implements	3.50 cavans of palay
Ration, $\frac{1}{2}$ cavan weekly, May 1 to September 30	10.00 cavans of palay
Supplies, tobacco, salt, etc.	6.00 cavans of palay
Money received at ₱0.50 per cavan, ₱12.00 (used for oil, meat, clothes, matches, etc.)	24.00 cavans of palay
Terkiaan, October 1 to November 15, 3 cavans	4.50 cavans of palay
	48.00 cavans
"Bugnos" (advance money)	₱20.00

A good average crop for a tenant is 100 cavans; his share of one half (50 cavans) less 48 cavans leaves him 2 cavans to pay on interest of the ₱20 advance money. Therefore as a rule ₱100 is sufficient to support a family of three for a year, with palay at ₱2 per cavan. If corn, beans, or peas are raised, one half goes to the owner after the deduction of the seed, but only a small amount of secondary crop is grown.

The owner exercises a power over the tenant that would be difficult to define. He is consulted on all affairs of ways and means and even marriage, absence from the land, use of animals, extra day or night work. In petty lawsuits the tenant must obtain permission to participate; otherwise he pays for loss of time at an enormous rate.

The dense ignorance of the tenant often leads him to be imposed on by his more astute fellows and landlords, but on the other hand he exasperatingly celebrates every fiesta in the calendar, and without careful watching will lose in a month by carelessness the crop it took him six months to produce. Yet he cheerfully submits to working out debts which are sometimes held only by verbal promises, often over a period of years; and once out of debt, he usually manages to fall in again before he realizes it. It is to the natural advantage of the owners to secure and keep the tenants in a constant state of debt.

In general, conditions on large estates worked by the share system approach those just described.

Number of plots leased. The amount of rice, tobacco, or corn land leased to the tenant in an organized-share hacienda varies with the locality, and particularly with the richness of the soil, but is usually one or two hectares. The amount of

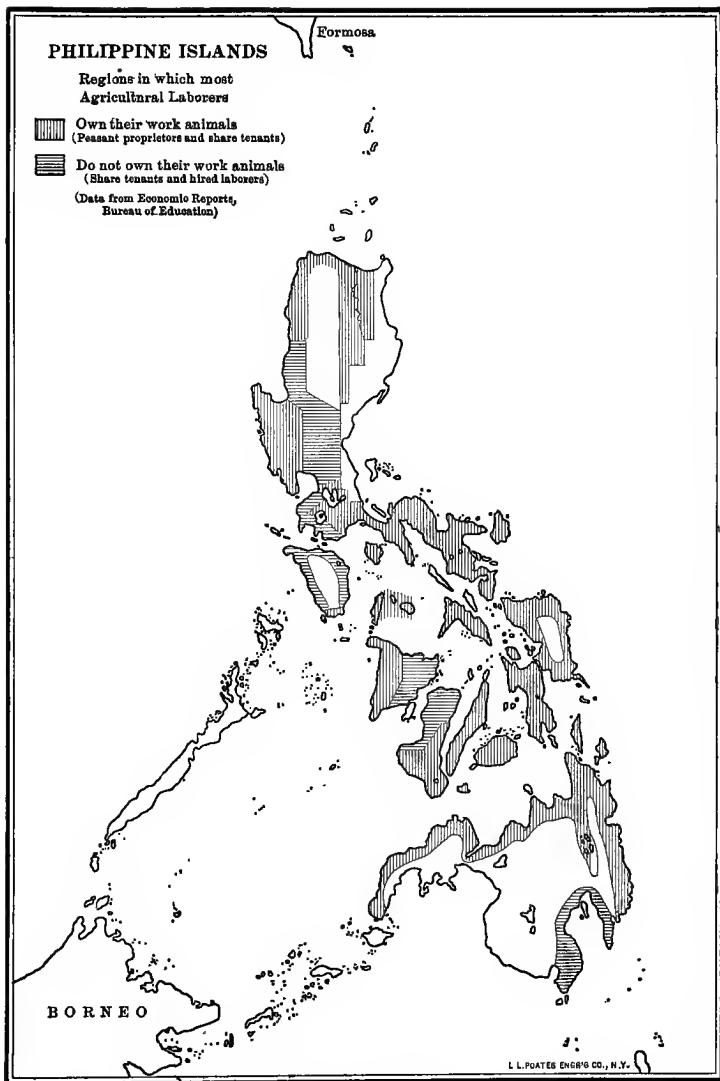


CHART XXXI

land given a tenant for sugar and abaca plantations is larger than for tobacco or rice, and varies from two to five hectares in plots separated or contiguous. It is seldom that more than one plot is leased, although on an hacienda where both rice and corn are grown, a tenant may have one lowland and one highland plot. When the landlord has lands both for rice and for corn or tobacco, two plots are sometimes taken, since these crops are grown at different periods of the year. A house plot in the village either goes with the leasehold or is rented at a small sum by the year.

Permanency of tenants. The agreement between tenant and landlord is sometimes, but not generally, written, and is most often for one season. Usually it is indefinite in nature. If the landlord is kind, and the tenant efficient, the lease continues. If the tenant does not please the landlord, he is ejected; if in turn he is not pleased, he may leave. In some places there are landlords who cannot get tenants in the locality, but have to go to other towns each year to secure them.

Division of the crop. The share of the crop credited to each of the three factors which produce it varies according to the custom of the locality, the fertility of the soil, the proximity to the town or market, and a variety of other conditions. However, the apportionment is usually based on a valuation of one third for the labor, one third for the work animal, and one third for the improved land. The division of crop therefore depends on who owns the carabao. If the tenant possesses a carabao, he gets two thirds of the rice crop, and the landlord one third; in other cases the owner usually gets two thirds, and the tenant one third. It seldom happens on a large share estate that a third person owns the work animal. On Chart XXXI it will be seen that most of the tenants on estates in the Cagayan Valley and in Zambales Province own their animals, whereas those on estates in the western part of the Central Plain of Luzon do not. In the Visayas most tenants on large share estates are furnished with animals by the owners. In some places tenants harvest and thresh the

crop; in others this is done for a separate consideration; additional harvesters are often employed on shares.

There are many variations in this general division of the crop, all of which cannot be given here; the most important, however, deserve mention. When the rice land is exceedingly fertile, the owner may receive one half the crop instead of one third; if it is not very fertile, or is far from the village (as upland fields), his share may be only one fourth, or even less. In Occidental Negros the landlord furnishes land, seed, and animal. The lessee does the work until harvest. One eighth of the crop is given to the harvesters; two thirds of the remainder goes to the landlord, and one third to the lessee. If the former furnishes the land only, he receives but one third. In some places an exact division of the crop is made under the first arrangement. In Bataan Province the landlord plants the crop, advances thirty pesos a hectare without interest, and cuts the crop. The tenant does all the other work, gathers the crop after it has been cut, and delivers the landlord's share at his home. In this case the crop is divided into two equal parts. If the landlord furnishes the land, carabao, and seed, and pays for extra labor in transplanting, he receives three fifths, the harvesters one fifth, and the tenant one fifth.

In Bataan the landlord on a sugar estate furnishes seed, fencing, and milling, and feeds the mill laborers. The tenant of a small plot does the planting and cultivating, feeds and pays extra field laborers, hauls the cane to the mill and sugar to the market, and receives half the product. If a third man is the owner of the mill, he furnishes the necessary labor for his mill, and the sugar produced is divided equally among the landlord, the tenant, and himself.¹

¹ In parts of Negros fully sixty per cent of the hacienda owners have men renting sugar lands from them under the *parcero* system. The *parcero* owns from one to twenty-five carabaos, and leases approximately two hectares of land for each work animal. He furnishes animals, labor, and field machinery, but is often financed by the planter, who lends him money at fifteen per cent interest, with his work animal and standing crop as security. The harvested cane is turned over to the planter, who takes fifty per cent of it as rent for

On abaca plantations the division is one third or one half unless the price of the fiber is low, and then the laborer obtains the greater share. It should be noted, however, that the third factor, the animal, does not enter into the production of abaca. Neither is the animal considered on a coconut plantation. In Laguna Province the tenant takes care of the grove, keeps out beetles, reports damage, and collects the nuts for counting. A number of nuts sufficient to pay the cost of picking and transporting are taken by the owner, and the tenant receives one fifth of the remainder. In southern Luzon, and on the Visayan Islands, half the copra is given to the tenant when he does the work outlined above and also prepares and dries the meat. In Tayabas the landlord gets two thirds of the copra, but has to build and maintain the drying kiln, and to provide the tenant with a house in the village.

Usually a part of the natural increase of domestic animals placed in the tenant's care becomes his property. By this custom a tenant frequently obtains a carabao, which advances his economic condition considerably.

Mutual rights and duties of landlord and tenant. The mutual rights and duties of landlord and tenant differ in various parts of the Islands. The tendency is to relieve the tenant of all duties except those directly connected with the piece of land leased. In most regions, however, it is still customary for the landlord to call on the tenant for group labor at harvest time, to repair and build houses, fences, ditches, mills, and the like, and to get wood and run errands. The custom of making small presents of farm or handicraft products to the landlord is still practiced by the tenant in some places, but is rapidly disappearing. No wages are paid for extra work unless it is of long duration, and then a money wage is often given.

the land. The planter also charges two pesos for each picul of the *parcero's* sugar for grinding the cane and boiling and transporting the sugar to Iloilo. When the whole hacienda is leased, the lessee does all the work and turns half the sugar over to the owner of the land and mill. In this form of lease the land is not worked by the *parcero* himself, but is cultivated according to the proprietary system.

Otherwise a gift from the landlord, and, in case of group work, a fiesta are supposed to recompense the tenant. The tenant's family, however, nearly always receives a daily wage when working for the landlord. The more services the tenant renders the landlord, the more likely he is to receive substantial advances of food and money, and the more lenient is the landlord's treatment of him. Formerly the tenant had to supply the landlord with wood, but this duty is now required in but few regions; he also threshed his rice, but with the introduction of threshing machines such duties are constantly growing less numerous.

The landlord may provide a tenant with a fiesta for a variety of reasons. He generally does this when he is the beneficiary of group labor. Sometimes he gives a fiesta at a stated period; for instance, after the harvest, or, less frequently, after planting. He often supplies music or other amusements at the yearly village fiesta.

Control of landlord over tenant. The control which the landlord exercises over the private affairs of the tenant varies greatly in different parts of the Islands. He usually defends him in court and against other persons in matters that pertain solely to the crop, and often looks after his private interests before the law. He does this to keep the tenant contented, so that he will remain on the estate. The tenant is to a large extent dependent on the landlord, and looks on him as his leader and director in times of emergency. The landlord arbitrates the tenant's quarrels and gives him advice and the benefit of his close supervision.

An important consideration in the share system, particularly on rice haciendas, is the question of advances and interests. Conditions in Nueva Ecija have already been quoted. For the Islands as a whole, interest on such advances ranges from fifty to five hundred per cent a year. When a debt is paid in kind, the landlord often takes produce at a lower rate than the market price; for instance, ₱0.50 a cavan below the market price for palay when it is selling at

from ₱1.75 to ₱2.25 a cavan. The landlord makes a further profit by holding the rice until July or August, when the price rises to ₱2.25 or ₱2.75. At this time the tenant frequently buys back at an advanced price the same amount of palay that he parted with at the end of the harvest, thus contracting another debt which must be paid at the next harvest, and so on from year to year. Most advances are paid in kind. In sugar, too, the landlord buys the tenant's share at a low market price, and holds it for a higher price, often making a large profit.

It is through advances, interest, and debt that the planter often controls the actions of the tenant and holds him to the land. Serfdom for debt was an ancient institution in the Philippines; to-day the Filipinos feel that honor compels the payment of a debt as soon as possible, and that a debt of a father attaches itself to the succeeding generation. An ignorant tenant, therefore, considers himself legally bound to the landlord by debt; in any case, he feels in honor bound to repay his debt as best he can. Hence it is that a tenant thrown out of a share estate because of his refusal to pay such a debt loses his reputation not only with the landlord but with the tenant class. By the law of custom he becomes an outcast. The ejected tenant, who has broken his contract or refused to cultivate the land, must usually leave the district. The landlord thus feels it to be to his interest to keep the tenant in debt; since he charges a high rate of interest on advances, he usually manages to keep the tenant's share covered. A tenant is thereby virtually working for his keep and a little spending money. Occasionally there is a landlord who encourages the tenant to get out of debt and acquire work animals and land, but he is the exception; sometimes there is a landlord who refuses to accept the payment of a debt, for the sake of keeping the tenant on the land.

In the most backward parts of the Islands the landlord has practically the control of the tenant; but the more enlightened the community, the less is the power of the

landlord. Where labor is scarce and there is a considerable amount of wealth generally distributed, the balance of power may be in the hands of the laborers.

The landlord on a large organized share estate determines the kind and amount of crop to be planted, and the time of planting and harvesting. The tenant must obtain permission to raise crops other than that so determined, to raise stock for his personal use, and, if in debt to the landlord, to sell his portion of the crop. The tenant nearly always carries out the orders of the landlord with respect to the tilling of the soil. Cases are known, however, where the tenant did not cultivate all the land he leased, and consequently the crop was smaller than it should have been; but the landlord claimed and received as his share the amount of palay which he would have obtained had all the land been cultivated. Sickness, however, is usually considered an acceptable reason for the production of a partial crop.

As previously stated, the tenant for the most part remains permanently on the farm. Sometimes another person who wants the tenant will persuade him to change, and will advance the money to pay off his debt to the landlord, thus assuming the debt. When the landlord is dissatisfied, he may tell the tenant to get the necessary money to pay his debt, in which case the tenant finds another landlord to assume it. When the landlord sells his land, his rights in the debt of the tenant are sold with it. In a few cases a tenant will leave the landlord when in debt to him. Here the latter has no recourse, though sometimes custom obliges any landholder who accepts a tenant to assume his debt to the former landlord. In case of the death of the tenant his children usually assume the debt. If they are old enough, they work it out on the land; young children often come to serve in the house of the landlord at a stated wage until the debt is paid. This is the foundation of the bonded debtor system discussed in Chapter XIII. It is seldom that the children repudiate the debt of their father; the unity of the Filipino

family is close ; moreover, failure to assume such a debt might result in the children's being ostracized by their associates.

In most cases where the tenant is mistreated by the landlord he simply leaves the estate. Both tenant and landlord have the right to take any matters involving breach of contract, mistreatment, or injustice to the courts, but neither often avails himself of this privilege. However, instances seem to be multiplying, since the tenant is beginning to understand his rights before the law.

The ownership of a work animal or of a small plot of land, or of both, gives greater stability to the tenant, secures him better treatment and terms from the landlord, and is more satisfactory to the landlord. Sometimes the tenant gives the landlord a guaranty of some sort ; this may be a title to a small plot of ground, or another person may stand responsible for his debt. In some places legal contracts are made, and debt or damages due the landlord can be obtained from the sale of the tenant's property. Such a tenant at will is, of course, much better off and much more independent than those previously described.

Income of tenant. The income of the tenant on a large share hacienda before the World War varied from ₱80 to ₱200 ; the average was probably ₱100. In general, a tenant of this class saves but little ; most of his income is expended for food, a little for clothing and luxuries, and the remainder in gambling. The largest income is, of course, obtained by the tenant owning a carabao.

Summary. In general the relationship of father and child may describe the attitude of landlord and tenant to each other. The landlord is paternal, the tenant filial. Nevertheless each looks out for his own interest ; the landlord tries to get as much out of the tenant as he can, and to keep him indebted and contented, so that he will not go away ; the tenant obtains as many advances as he can, and works as little as possible. The landlord regards the tenant as a natural and easy means of getting his land worked. The tenant looks

on the landlord as a business benefactor. Their condition and the real feeling of each to the other depend on the disposition and the enlightenment of the landlord, and the state of ignorance of the tenant and his willingness to work. In most cases the tenant must depend on the landlord. Often he is unable to plan his career alone, and looks to the landlord for direction in the most trivial matters. The latter usually encourages this dependence, and stands in a paternal attitude toward the tenant. The tenant generally respects and loves the landlord; the landlord is godfather to his children; perhaps the landlord's father was the tenant's godfather. The landlord appreciates the work of a good tenant, and encourages him to increase his output. At times an unscrupulous landlord may overburden his tenant, or even require services which he has no right to demand. On the other hand, the tenant, if left to himself, neglects his duties and often causes the landlord much inconvenience. The landlord is not always gently paternal, but may be domineering, arrogant, and selfish; the tenant is often so extremely ignorant, lazy, shiftless, and fickle that it is impossible to utilize him as a producing agent unless some system of compulsion is maintained.

In the more advanced regions of the Philippines the tenant is beginning to learn something of his personal legal rights in his relations with his landlord. The landlord who has been somewhat overbearing in the past is being deserted. The confidential relation is in some cases becoming less close; in a few regions a considerable amount of trouble is experienced with the tenant who leaves without making a settlement.

Share System of Scattered Holdings

The share system of scattered holdings is found in those regions in which all or part of the land is divided into small and medium-sized parcels. Such holdings do not permit of the hacienda system (either proprietary or share) even when

owned by a few rich families. Leo J. Grove, Supervising Teacher, has estimated that the total cultivated area of Camiling, in Tarlac Province, is about 16,000 hectares, divided into 15,000 parcels. By subtracting a third of the parcels, and a thousand hectares allowed for building lots, we shall see that the average parcel is about one and a half hectares. About half of these parcels are owned by people who have from five to thirty scattered plots, and do not work their own land.

Where such holdings exist, it is a common practice of the tenant to take more than one plot; these plots are as a rule widely separated. They aggregate in area the amount of land ordinarily leased by a tenant under the *kasama* system. The tenant tries to get adjacent plots, but on account of the peculiar method by which these are owned (explained under the heading *Size of Parcels*, page 220) it is not often that such plots are available. For instance, in the coast towns of Albay it is rather common for a tenant to rent one plot on the mainland and one on an adjacent island. The owners of parcels of land which are not large enough to support the family often cultivate other plots on shares.

The systems of division of the crop are much the same as those discussed under the *kasama* system. However, a few others exist. Sometimes, as often occurs in Samar, the work animal is owned by a third person, who receives one third of the crop. On the small sugar plots where the landlord provides a primitive mill the tenant usually gets two thirds of the sugar produced, but furnishes all the labor. In the production of abaca the landlord sometimes pays a premium over the usual share if the tenant materially improves the production. In the cultivation of intensive crops which require no animal, such as betel in Pasay near Manila, the crop is equally divided between landlord and tenant. Sometimes the owner of a small piece of land borrows money on it, and gives the lender full possession and rights to its use until this is returned. The interest takes the form of the

product of the land; it may net the lender from forty to eighty per cent. The owner gets back the land whenever the money is returned. In the usual contract for sale a time is set when the borrower loses the land if the money is not returned. In the system noted above, however, the contract extends indefinitely.

Under this system the tenant often brings virgin land under cultivation on condition that he have the use of the land for a period of years, or receive a portion of it, cleared and planted, as his own. On coconut lands in Oriental Negros the tenant sometimes receives all that he can raise between the palms he sets out. He must care for the young trees, and when they are too old to permit cultivation between them, he receives from one tenth to two tenths of a peso for each of them. In Cavite he is given a fourth of the land, having cultivated between the trees for four or five years. In Mindoro and other places where land is plentiful the tenant receives half the land. In Sorsogon the tenant clears the forest, plants a garden plot with corn and sweet potatoes for himself, and sets out abaca for the landlord. In three years the abaca is ready to strip. From the first three strippings the tenant receives the entire product; then, about four and a half years after the planting, the ordinary division is made. When the tenant clears rice land, constructs the necessary irrigation canals, and brings the plots into cultivation, he receives as payment, in Pangasinan Province, the crop for from one to five years; in Sorsogon, the crop for about three years.¹

¹ These are excellent examples of rent in the economic sense of the word. The rent for the productive powers of rice land in Sorsogon Province is, for each crop, one third of the labor of clearing the land, of draining it, and of diking it, ($\frac{\text{labor on land}}{3}$). The word "rent" has two meanings, one popular, the other scientific. Thus far it has been used in the popular sense, and refers to the sum paid for the use of the productive powers of the land as well as of the improvements thereon, such as fences, irrigation ditches, freedom from stones, and the like. The rent for a given plot of land increases with the value of these improvements, and decreases with the exhaustion of the soil (productive powers). The scientific meaning of the word is limited to

The services which the tenant performs for the landlord in the system of scattered holdings are much fewer than those in the *kasama* system. The custom of requiring services is fast passing away. In general, too, the condition of the tenant is much better under this régime than under the *kasama* system. The tenant often possesses one or more *carabaos* or is the owner of small plots of land; the landlord can obtain from the sale of these any sums due him. Indeed,

a consideration of the productive powers of the land; in the following discussion of the law of rent (taken from Laughlin's "Elements of Political Economy") it should be so understood:

"Lands are of varying degrees of productiveness. They vary not only in their power of producing different articles, such, for example, as wheat and tobacco, but they do not all produce the same thing equally well. . . . The slope, drainage, constituents of the soil, vary from field to field even in the same farm, so that some lands afford a large return to labor and capital, while others do not; the former are superior, and the latter are inferior soils as regards fertility.

"Two pieces of land, which are of equal fertility, as regards their natural productiveness, might also be so affected by situation that one would be classed as superior and the other as inferior. Suppose that one piece, A, were situated near a railway station, and another, B, twenty-five miles away from any market, and that each parcel of land produced one hundred bushels of wheat. In the case of B the value of ten bushels might be spent in carrying the produce to the station near which A was situated. The farmer of B would be no better off than if he cultivated land close by A which produced but ninety bushels. The cost of transportation enters into the outlay of producing wheat on B, so that although equal in natural productiveness, B is really inferior to A by situation; consequently we may speak of superior and inferior lands, although this difference of grades may be due solely to situation. . . .

"When different grades of land are in cultivation at the same time (producing the same article), the cultivator of the richer soil receiving the same price per bushel as the cultivator of the poorer soil, the former will get more for his work . . . than the latter. The same labor . . . produces on the rich land more bushels per acre than it does on the poorer land; and as the price at which each bushel is sold is the same, the return to the former . . . is greater than the return to the latter . . . although they are equal in both cases. This surplus of the value of the product of the richer over the poorer land, when both are needed for cultivation, is rent; and the whole of it goes, under free competition, to the landlord or owner of the land.

"This law accounts for the range of rents per hectare mentioned under the Rent System, and also for the varying parts of the crop which are given the landlord in the share system."

in some localities the landlord will seldom advance much money unless the tenant owns some property.

The financial and general condition of the tenant under this system is much better than on the large estate. His income before the World War varied from ₱100 to ₱400, and averaged probably ₱200. He obtains an additional income from other sources than the plot he rents, just as a peasant proprietor obtains an additional income. The following is an estimated income:

<i>Farming</i>			
Rice	₱100		
Sugar	100		
Mango trees	20	₱220	
<i>Fishing</i>		10	
<i>Wages as carpenter</i>		25	
<i>Earnings of wife and daughter as hat or</i>			
<i>mat weavers, etc.</i>			
		25	
		₱280	

In general, it may be stated that since, under this system, the holdings and tenants are scattered, the landlord cannot exercise the same control over his tenants as he does in the kasama system. Moreover, the tenants usually belong to a more intelligent class of laborers, and in the majority of cases own work animals and often small plots of ground. These give stability and a sense of responsibility not possessed by the tenants on the large hacienda. Landlord and tenants usually get along well, the landlord looking on his tenants as poor relatives (which they often are) for whom he is somewhat responsible, and being recognized by them as a superior personage. Sometimes the tenants are independent of the landlord except in matters directly concerned with the soil.

It is evident, therefore, that the tenant under this system is in a much better condition than the tenant under the kasama system. His income is greater, and he is much more independent of the landlord. Indeed, he may rent from two landlords.

Interleasing Share System

In Ilocos Norte and parts of Ilocos Sur ninety per cent of the tillers of the soil own land. Yet eighty per cent of the land is worked on the share system. Here the landowners lease their more distant parcels, and in turn become tenants on more conveniently situated plots on the same or even less remunerative terms. The parts of the Philippines in which nearly all or much of the land is cultivated under the interleasing system are, as has been stated (page 232), Ilocos Norte, Ilocos Sur, and Pangasinan provinces; much of Bulacan and Bataan provinces; parts of Rizal, Cavite, and Batangas provinces; parts of the Bicol provinces; and parts of Cebu and Leyte provinces. Since the interleasing system is carried out by peasant proprietors merely to lessen the disadvantage of widely scattered plots, it may well be linked with the peasant proprietary system. When these two systems are considered together, it may safely be said that the greater number of the small holdings in the Philippines are cultivated by peasant proprietors.

GENERAL COMPARISON

Proportions of Tenures and Classes of Cultivators

Probably nine tenths of the land in the Philippines is cultivated either by peasant proprietors or on shares. In view of the dual rôle played by many tillers of the soil, it is probably safe to say that forty-five per cent of the land is cultivated by peasant proprietors, and forty-five per cent by tenants. Hired labor is used on most of the remaining tenth of the land. The amount of land rented outright is small.¹

¹ The following comparisons are interesting:

In Bulgaria there are less than 100 agricultural properties of more than 100 hectares (250 acres); out of 700,000 odd families of the nation, 550,000 own their own farms. The democracy and strength of the people of this country was shown in the Balkan-Turkish War (the *Outlook*, February 8, 1913).

Factors which are changing the Proportions

In many places the proportions of classes are changing ; in general, the peasant proprietors are increasing, being recruited from the tenant class. This results, first, from the tenant's obtaining a carabao as his half of the natural increase of the animals under his care ; secondly, from the increase of household industries and other outside activities ; thirdly, from a greater intelligence.

In a few places, as in Iloilo, large holdings are increasing, first, because the small holders are not able to take care of their own interests, and therefore lose their land ; secondly, because the children of small owners, educated in the schools, are no longer contented with the meager living, and are entering other pursuits in which they can earn more. This causes, in a few localities, a small increase in the proprietary and share systems.

As has already been stated, in nearly all parts of the Philippines the tillers of the soil are desirous of improving their condition by acquiring work animals and land. In some places the number of those who make this attempt is small ; in others it includes nearly all the cultivators who have the opportunity. In this respect probably certain islands in the Visayas are the most backward ; the Ilocanos are the most active. The custom which gives to the tenants a part of the natural increase of the animals in their care is often a help to independent proprietorship. Ilocano tenants in general, and tenants of various towns in other parts of the Philippines, accumulate

According to the census of 1910, 62.1 per cent of the farmers in the United States are owners, less than 1 per cent are managers, and 37 per cent are tenants. Of the tenants, two thirds are rent tenants who pay a stated amount (usually cash) per acre of land rented, and one third (or about 12 per cent of all farmers) are share tenants. The average parcel of cultivated land is 30 hectares (75 acres).

In France the properties of peasant proprietors cover a large part of the soil, and are increasing.

In Mexico there are districts in which the majority are peasant proprietors ; yet much of the land is cultivated under the advance and debt share system.

enough money through outside work and through household industries to purchase a carabao and even the land on which they live (see Household or Domestic Manufacture, page 365). In Laguna Province the landlord often furnishes the land and seed, and sells carabaos to the tenants on credit without interest, although if payment is made in produce there is the usual discrepancy between the market price and the price credited to the tenants.

Throughout the Islands the larger number of tenants who attempt to provide themselves with carabaos and land fail. As soon as they become independent and are deprived of the benefit of supervision by the landlord, they relapse into indolence, devote themselves to gambling, or commit indiscretions, and soon lose their possessions. Their inability to manage their own affairs is against them. Often their attempt is premature, because they have to borrow money to pay for the animal or land, and the high rate of interest charged on sums borrowed soon results in the loss of animal and holdings. Sometimes the former tenant and his family will get along well until death or marriage occasions a fiesta, at which time all accumulation and possessions are spent.

In spite of these conditions, however, the peasant proprietors are almost everywhere increasing in relative importance, especially since the economic development of the Philippines has brought with it higher wages and ability to save for investment.

Condition of the Classes of Cultivators

It would appear that the greater the percentage of large holdings in a town, the poorer is the condition of the laboring class. The hired laborer and the poorer tenant are illiterate; their knowledge seldom extends outside the hacienda; they have no initiative or idea of responsibility; their attitude toward the landlord is subservient; they lack stability; they are poorly clothed, fed, and housed, and simply exist. The public schools have not drawn so large a proportion of pupils

from this class as from other laboring classes. More farm work is expected of the children, and they are not encouraged to go to school.

Tenants as a class are usually poor, but their livelihood is assured; their food, housing, and clothing are better than those of hired laborers; they are usually ignorant, and in debt on account of the high rate of interest, but they receive the protection and advice of the landlord. Their assumption of responsibility is greater than that of hired laborers, and as a class they accumulate more. Even if he owns nothing, the tenant's interest in a share of the crop gives him a certain stability, and it is only where this is taken away (by action of the landlord, who appropriates all the crop above the bare necessities and holds the tenant in debt) that he is reduced to the condition of the day laborer. The income of the tenant having a carabao or land is larger than that of the simple tenant; his position is the most stable of the tenant classes.

In the most backward regions of the Philippines the peasant proprietor classes are very ignorant, and often not very industrious. Sometimes they are really tenants on share, since their land is controlled, through debt, by the landlord class. Such proprietors are little better than the average tenants on share, if indeed they are as well off.

If possessed of a false pride on account of ownership of land, the peasant proprietor has no inclination to exert himself, and does not supplement his income with the proceeds of outside labor. The difference in the individuality of peasant proprietors is especially noticeable when industrious peoples like Boholanos or Ilocanos settle among an indolent population.

The peasant proprietor usually has some education; he can get money at a lower rate of interest (though still usurious) than the tenant; he builds a better house and has better food and clothing; he usually prides himself on the ownership of animals, a granary of palay, rice, or corn, and a small amount of land; he is anxious to give his children the advantages of education; and his social pleasures are much greater than

those of either the tenant or the hired laborer. In general, the peasant proprietor lacks the advantage of supervision by better educated men, and he is liable not to get so much out of the land as he might. He stands some chance of losing his possessions by quarrels in court, crop failures, or other misfortunes. On the other hand, his greater interest in the crop more than offsets the decrease due to lack of supervision by the landlord, and he often grows a far greater variety of crops than does the tenant. To sum up, the peasant proprietor is hard working, but lacks the elementary education and business thrift to provide for emergencies.

Condition of the Landlord Classes

In considering the landlord classes we include only those who own large estates, either proprietary or share. Many are careless in their farming, trusting rather to luck than to good management, and therefore many haciendas are heavily encumbered with debt.

The average landlord feels that the proprietary or tenant system is the only one which will succeed with the class of men with whom he has to deal. He may even oppose the effort of tenants to better their condition and become independent, because he feels that he is being deprived of labor.

In general, the landlord class in the Philippines has no appreciation of modern methods, and does not give enough attention to the land. Systems of accounts are needed, as well as carefully worked out farm systems, and a greater knowledge of farming and business is required. Encouragement of greater efficiency in laborers through general education, fair treatment, and just reward, and the use of modern methods give better results in agriculture than the advance and debt system at high rates of interest, such as now prevails on nearly all large Philippine estates. This advance and debt system seems at first sight advantageous to the landlord, since he receives a large rate of interest and is able to hold his tenants. It is

really, however, disadvantageous to him, since it compels him to invest all his money in agriculture. Were the hired laborers and the tenants independent of these advances, the landlord classes could invest their money in other enterprises and increase general business activity in the Philippines.

ENCOURAGEMENT OF AN AGRICULTURAL MIDDLE CLASS

So far as the Islands in general are concerned, the peasant proprietor is the best citizen because of his stability and his sense of responsibility. Few of the tillers of the soil in the Philippines get out of the land nearly what it should produce; nevertheless it is probable that the peasant proprietor, although lacking supervision of the landlord, produces more than other agricultural laborers. But more than this, the independent tiller of the soil is the best citizen; a man who owns something for the government to protect takes a greater personal interest in that government. It is noteworthy that the lawless elements with which the Philippines have at times been harassed have not originated where peasant proprietors predominate. The peasant proprietary system has disadvantages. In the cultivation of export crops such as sugar and tobacco, and, to a less extent, abaca and copra, the hacienda system is often the best, since the tillers of the soil, when left to themselves, frequently produce a low-grade article, and are at the mercy of the middlemen. In such cases agricultural progress may be hampered; for instance, at the present time it would be impossible for peasant proprietors to improve the methods of producing sugar, as is being done on the large sugar haciendas. When food crops are raised, however, the peasant proprietor, as consumer, is directly interested not only in the amount but in the quality of the crop.

The government recognizes the desirability of an independent agricultural middle class, that is, a class between the hired laborer and the landlord, for independent citizenship is always the basis of democracy. The homestead laws, the

activity looking toward the settling of land titles, and the agitation for lower rates of interest, all have in view the extension and protection of the peasant proprietary class.

PUBLIC LAND AND HOMESTEADS

To obtain title to a piece of public land in the Philippines, certain government regulations must be carried out and certain sums of money paid. The mere settlement and tillage of the land do not give title. There are three methods in the Philippines whereby public land may be owned or controlled by an individual. First, a plot of 16 hectares (40 acres) of unreserved, unappropriated public land which is not more valuable for mining or forestry can be taken as a homestead; the person taking up this land must reside on it for a period of two years immediately preceding the date of filing his final proof, cultivating and improving it for five years, and must pay ₱10 at the beginning and at the end of the term. The fees may be paid in installments of ₱4 each. Secondly, a plot of 16 hectares of public land which has not been surveyed under either the Spanish or the American rule may be purchased by an individual; although it is not necessary for him to reside on the land, he must cultivate it for five years before he can obtain a full title. Thirdly, public lands are also leased to individuals, corporations, or companies in parcels of not more than 1024 hectares (2400 acres) for a period of twenty-five years with the privilege of renewing the lease for another twenty-five years.¹

The amount of public land in the Philippines is very large; nevertheless, the results obtained from the homestead law have been unsatisfactory. In the year 1912 only 3105 homesteads were taken, the largest in a number of years and double that for the year 1910. Of the applications filed five years before, five per cent of the applicants did not cultivate any of the land applied for, and fifty per cent were not complying with

¹ "Primer containing Questions and Answers on the Public Land-laws in Force in the Philippines"; also Act 1864 of the Philippine Legislature.

ANNUAL DISPOSITION OF PUBLIC LANDS FROM 1908 TO 1917
[Source: Bureau of Lands]

FISCAL YEAR	HOMESTEAD				SALES				LEASES				FREE PATENTS				
	Applications received		Entries allowed		Applications received		Accomplished		Applications received		Executed		Applications received		Issued ¹		
	Num-ber	Area	Num-ber	Area	Num-ber	Area	Num-ber	Area	Num-ber	Area	Num-ber	Area	Num-ber	Area	Num-ber	Area	
1908	2,196	27,411	392	Ha.	Ha.	51	584	6	76	56	20,278	Ha.	2,045	9,837		Ha.	
1909	1,854	25,010	157	2,138	45	544	1	16	33	8,097	74	10,500	Ha.	4,495	11,964	135	653
1910	1,427	18,192	101	1,372	68	3,862	3	3,496	3	1,920	44	12,399	Ha.	8	35	144	910
1911	2,789	32,625	414	5,187	91	8,270	5	64	112	37,392	119	22,161	Ha.			381	1,868
1912	3,105	36,963	309	3,855	180	8,270	49	8,907	119	22,161	98	26,645	Ha.			62	2,537
1913	4,468	56,172	312	3,909	289	6,403	15	177	98	26,645	78	15,616	Ha.	1,191	5,890		
1914	5,552	72,361	587	7,599	337	7,680	23	749	78	15,616	448	1,376	Ha.	1,376	5,089		
1915	7,465	94,907	758	10,017	431	8,333	109	2,757	103	20,693	5	2	Ha.	1,706	5,848	2,076	2,985
1916	8,198	109,505	3,345	37,990	301	3,610	109	2,757	103	20,693	39	13,103	Ha.	1,819	9,070	2,216	6,702
1917	8,922	111,733	3,330	69,541	683	16,801	70	893	166	50,604							

NOTE. The public lands, of which there are 7,240,500 hectares suitable and available for agricultural purposes, cover about twenty-four per cent of the entire area of the Archipelago, and are disposed of by homesteads, leases, sales, and free patents. During 1917 there were 8922 applications for homesteads, 166 for leases, 1819 for free patents, and 683 for sales.

A homestead is a parcel of unoccupied and unappropriated nonmineral agricultural public land, not exceeding sixteen hectares, disposed of and granted to any citizen of the United States and the Philippine Islands who has resided on the land for at least two years and cultivated it for the term of five years immediately succeeding the filing of application.

All unoccupied, unreserved, nonmineral, agricultural public lands are subject to lease upon annual payment of not less than fifty centavos, nor more than one peso and fifty centavos per hectare, to any citizen of the United States and the Philippine Islands, or to any association or corporation of persons for a period of not more than twenty-five years, each lease not to cover more than one thousand and twenty-four hectares for each such person, association, or corporation. Upon the expiration of said period the lease may be renewed by the same lessee for another twenty-five years.

A parcel of unoccupied, unappropriated, and unreserved nonmineral public land, not exceeding sixteen hectares for an individual and one thousand and twenty-four hectares for a corporation or like association, may be sold at a public auction to the highest bidder, who must be a citizen of the United States and the Philippine Islands.

Any native of the Philippine Islands who has continuously occupied and cultivated an unreserved, unappropriated agricultural public land since August 1, 1898, and who is now an occupant and cultivator of the same, is entitled to have a patent issued to him without compensation for such tract of land, not exceeding sixteen hectares.

¹ Free patent is issued five years after the filing of an application.

the law concerning residence. The average area cultivated was four hectares. The Filipinos often become squatters on land in preference to taking up a homestead. In some places landlords oppose homesteading by the tenant class. In certain regions where most of the public land is in the highlands, the people prefer to lease land in the lowlands, so that they may grow irrigated rice. Undoubtedly the building of roads into the interior of certain islands will increase the number of homestead applications there. Lack of animals has in many instances reduced the number of applicants; in general, also, the village system has kept a hold on the tenant, who has preferred to live with his relatives rather than establish himself alone at some distance from the barrio. With the exception of a few peoples such as the Ilocanos and the Boholanos, the pioneer spirit has been lacking among the Filipinos.

By 1918 conditions were still far from satisfactory, although the increase in applications had been very great. From 1904 to 1912 there were 17,000 applications, and from 1912 to 1918 there were 43,000, making 60,000 applications in all. Of these about 30,000 had been approved, the other half having been withdrawn or pending. The number of Torrens titles granted was 1640. Most of the applications were from Nueva Ecija; Tayabas, Cagayan, and Camarines follow in the order named.

Most of the leases to corporations have been made in Davao. There are some leaseholds in other parts of Mindanao and Sulu.

AGRICULTURAL COLONIES

One reason for the large number of homestead applications filed in Nueva Ecija is its proximity to the densely populated Ilocano provinces and the southern part of the Central Plain of Luzon. (See Chart XXXIV.) There are large areas of fertile unoccupied land in the Department of Mindanao and Sulu which are too distant to be settled by individual initiative alone. In these the government is settling colonies.

Cotobato is the principal region. In 1917 it had six colonies with 929 families, or 5310 persons. They cultivated more than 1000 hectares of rice land alone, besides raising quantities of corn and other products. They had 3893 pigs and 14,560 chickens. All this had been accomplished since Act Number 2254 was passed in 1913. The government paid the passage of the colonists, advanced money, and provided carabaos and farm implements. By 1916 the colonies were well established, and the colonists had begun to repay these advances.

Act Number 2806 authorizes provincial boards to organize and manage agricultural colonies on public lands.

LAND TITLES

Throughout the Philippines much of the land, both large and small parcels, is held by people who have no documentary title to it. In most cases their titles can be proved. In many cases large tracts are disputed by two or more parties; or squatters have taken possession, claiming them as public land. In a few instances this situation has produced a very chaotic condition. The laws of the Philippines allow individuals to prove their ownership of pieces of land in courts of land registration, and to obtain legal registered Torrens titles. In time all parcels of land will be legally registered, and agriculture will be placed on a much firmer basis than it now is. It is the practice of the courts to grant Torrens titles when ten years' continuous, undisputed occupation of the land is proved.

The percentage of farms held under legal title varies in different parts of the Islands. For instance, in Union Province eighty per cent, that is, about 70,000 parcels, are held under no legal title; in Rizal about fifty-five per cent of the farms, or about 16,000 parcels, are also held under no legal title. From 1903 to 1918 there had been for the entire Philippine Islands only about 15,000 applications for registration of title,

of which more than 12,000 had been confirmed by the courts. The individual registration of titles is slow and costly, particularly for small parcels. The law therefore provides that cadastral surveys may be made covering whole municipalities. From 1903 to 1918 there were 220 cadastral surveys, covering 235,000 parcels. Even under the cadastral system the registering of land titles will be comparatively slow, however, and a satisfactory situation with respect to titles of agricultural lands cannot be expected within this generation.

INTEREST RATES

The exorbitant interest charges in agriculture which have obtained in the Philippines have been noted in this chapter. The necessity of reducing these is evident. Legislation has made high rates illegal. The question really depends on land tenure and available capital, which is discussed under Exchange, in Chapter XVIII. Act Number 2508 and amendments authorize the organization of Agricultural Credit Coöperative Associations. By 1918 there had been 240 of these societies organized; about half of them were successful. These had pooled the money received as membership fees, and were lending it successfully to their members. The extension of the number of these societies and their usefulness were greatly hampered, however, by the lack of capital. In 1919, therefore, the Philippine Legislature passed Act Number 2818 appropriating ₱1,000,000 for investment in loans to Agricultural Credit Coöperative Associations. All this money was distributed in 1919. Although this Act is undoubtedly a step in the right direction, its purposes are limited. Only ₱2000 can be lent to any association, and the period of maturity is fixed as of June 30, 1925. Moreover, these loans have been granted only for the breaking and cultivation of new rice or corn lands; or for the purchase of work cattle or agricultural implements necessary to increase the production of rice and corn; that is, this Act

aims particularly at effecting an increase in the food supply of the Islands. If these loans prove successful, the Legislature may be persuaded to appropriate additional capital for the purpose of financing small farmers in general, no matter what the product of their farms may be.

CACIQUISM

It is evident that the ignorance of the agricultural classes, their lack of initiative, and their inability to care for themselves, together with the ancient custom of loans, high interest rates, and honor connected with debt, place a considerable amount of power in the hands of large landowners and persons of intelligence. In the Philippines the possessor of such power is called a cacique. The control which the cacique may exercise over his tenants or even over peasant proprietors has been discussed at length in this chapter, and applies not only to agricultural affairs, but to everyday private and public matters. Often so complete is the control of the cacique that he can use his power to his own advantage and to the detriment of the tillers of the soil. It is such abuse that has attracted odium to the word. During the last ten years the power of this class of men has waned with the increase of education and the greater initiative and independence of the people.

This question is a delicate one, but will probably be solved in time by the education of the masses, both in and outside the schools. Great care must be taken, of course, that the laborer, while given a knowledge of his rights and a desire for better things, is not at the same time deprived of his present ideas of the honor of paying obligations. This might result in as bad a condition as that on the haciendas of Negros. Laborers who are not capable of becoming peasant proprietors must be taught to feel the force of moral obligation, if the power of the landlord through time-honored custom is removed. As they become aware of their rights, laborers must acquire a corresponding sense of responsibility. That the present

system of public instruction will finally do away with one-man power there can be little doubt. The following extract from the report of the Director of Education, 1912, is of interest in this connection:

The aims of instruction in the lower grades of the public schools are to enable the pupil to understand, read, and write simple English; to give him a sufficient knowledge of figures so that he can later protect his own interests in minor business dealings; and to provide him with a limited fund of information on the subjects of geography, sanitation and hygiene, government, and standards of right conduct.

In 1918 the Legislature provided funds to extend both primary and intermediate education to all children of the Philippines. The following table indicates the growing importance and scope of public education in the Philippines:

YEAR	NUMBER OF SCHOOLS	TOTAL ANNUAL ENROLLMENT	AVERAGE MONTHLY ENROLLMENT	AVERAGE DAILY ATTENDANCE	TOTAL EXPENDITURES	AVERAGE COST OF EDUCATION FOR EACH PUPIL	ESTIMATED SCHOOL POPULATION	PERCENTAGE OF ENROLLMENT TO SCHOOL POPULATION
1908	3,932	486,676	339,243	264,807	P5,127,117.15	10.53	1,394,000	34.09
1909	4,424	570,502	405,478	299,625	5,747,997.32	10.08	1,419,700	40.10
1910	4,531	587,317	427,165	314,336	6,475,326.81	11.03	1,445,900	40.61
1911	4,404	610,493	446,889	355,722	6,447,713.25	10.56	1,472,400	41.46
1912	3,685	529,665	395,075	329,073	6,527,636.65	10.43	1,499,500	35.32
1913	2,934	440,050	329,756	287,995	6,461,322.41	14.68	1,527,100	22.26
1914	4,235	621,030	489,070	428,552	7,639,178.65	12.30	1,655,200	39.93
1915	4,291	621,114	501,630	448,014	8,056,121.10	12.97	1,583,900	39.21
1916	4,412	638,543	523,272	471,195	7,430,439.73	11.64	1,611,600	39.62
1917	4,702	675,998	567,625	514,263	9,164,222.58	13.56	1,639,800	41.22
1918	4,747	671,398	569,475	521,377	10,730,210.00	15.98	1,668,500	40.24

Since the agricultural tenants are beginning to organize themselves into unions, and the government has passed a law authorizing the appointment of a committee to investigate the conditions of the agricultural tenants, the question becomes one that must be solved.

At the beginning of the year 1918 there was organized in the Municipality of Bulacan, in Bulacan Province, a society called Union ng Magsasaka, composed of agricultural laborers commonly called "aparceros." The aim of the society was the betterment of the conditions of the aparceros. From the beginning this society was an important body, since it had nine hundred and seventy-three members, with committees properly organized in several barrios of the municipalities of Bulacan, Bokawe, Guiguinto, and Bigas.

The conditions of agricultural labor (aparceria) which existed in the province of Bulacan before this society came into existence were as follows: the harvested palay was divided into equal parts between the landowner and the agricultural laborer, the expenses for preparing the land and cultivating it being met by the tenants. The agricultural laborers did not object to dividing the product into equal parts, but wished the expenses also to be divided equally.

The laborers made the following demands: (1) that the expenses for the transplanting, sowing, reaping, and threshing be divided between the landowner and the agricultural laborer; (2) that the straw be for the laborer; (3) that the expenses for the transportation of that part of the harvest belonging to the landowner be met by him, the agricultural laborer taking charge of the work; (4) that the land commonly called "caratin" (lands near the sea which become flooded at high tide) be the subject of a special contract between the landowner and the laborer (aparcero); (5) that the seed be the landowner's, but that an equal amount of palay be given to the aparcero before the partition of the crop; (6) that the money lent to the aparcero be paid in palay at current market value; (7) that no member of the Union ng Magsasaka should be dismissed except after an investigation by the society and the landowner; in the same way no member of the society should quit work without six months' notice to the landowner.

As a result, an agreement was reached between the landowners of Guiguinto and the representatives of the association:

1. The expenses incurred by the transplanting of seed, the planting, reaping, and threshing, shall be divided into equal parts between the landowner and the agricultural laborer.

2. The product harvested shall be divided between the agricultural laborer and the landowner.

3. The straw left in the threshing shall also be divided between the two parties, but the quantity necessary for feeding the carabaos in the intervening period between the planting and the reaping shall be deducted before the division.

4. The expenses for the transportation of the share of the landowner shall be met by him, but the work shall be done by the laborer.

5. The lands called "caratin" (lands which become flooded at high tide) shall be the subject of a special contract between the two parties.

6. The seed shall be the landowner's, and shall be returned by the agricultural laborer in the same quantity and quality after the harvest.

7. The total amount of money borrowed by the laborer for the preparation of the land and the planting shall be paid in palay at the current market value. All money borrowed for different objects other than the one already stated shall accrue at interest not higher than that allowed by Act Number 2655, known as the Usury Law.

8. Any member affiliated with the Union ng Magsasaka shall not be dismissed without an investigation by the representatives of both parties.

9. No member affiliated with the Union ng Magsasaka shall leave or quit work without six months' notice to the landowner.

The landowners of Bokawe would not enter into any terms of agreement with the members of the Union, and so the laborers emigrated to neighboring provinces.¹

¹ From the report of the Director, Bureau of Labor, 1918.

SUGGESTIONS FOR REVIEW AND ORIGINAL WORK

SUGGESTIONS BASED ON THE TEXT

1. Cause of the formation of small land holdings in the Philippines. 2. Regions in which they predominate. 3. The medium-sized plots and democracy. 4. Regions where large land holdings predominate. 5. Large holdings in relation to extensive agriculture.

6. The cause of the scattered holdings in Philippine agriculture. 7. The bad effect of this system. 8. What steps Filipino agriculturists take to reduce these bad effects. 9. The probable results of education, advance in agriculture, and advance in prosperity and the standard of living on the consolidation of scattered holdings.

10. Why is the peasant proprietor the backbone of a country like the Philippines? 11. How can the number of peasant proprietors be increased?

12. Share systems used in the Philippines. 13. The theoretical advantage of the share system over the proprietary system (*a*) for the laborer, (*b*) for the proprietor. 14. Duties of (*a*) the laborer, (*b*) the proprietor. 15. Division of the crop among the factors of production, that is, (*a*) the land, (*b*) the capital, such as carabaos and implements, and (*c*) the laborer.

16. Abuses of the system (*a*) by the landlord, (*b*) by the tenant. 17. Economic status of the share tenant. 18. Can these abuses be regulated by law? 19. What will be the effect of education and general economic progress on the relations between tenant and landlord?

20. Have a student draw up a bill which shall regulate the *aparceria* system (share system) by protecting the *aparcero* as well as the landlord. 21. Have the class convene as the Philippine Senate and discuss this bill. Such a bill was discussed in the Philippine Senate in 1918.

22. Why the public lands of the Philippines should not fall into the hands of a few. 23. How the Homestead Law prevents them from doing so.

24. From Charts XXXIV and XXXV decide which provinces and regions of the Philippines should have the least homestead

applications; which the most. 25. Indicate what you think are the principal regions of homesteading, and tell what peoples are settling in each.

26. You own a farm of twenty hectares, but have no legal title to it. You wish to borrow ₱2000 to make improvements. Will the bank lend you money? Why? 27. On what security will you be able to borrow the money? 28. What interest shall you have to pay? 29. Compare it with bank interest.

30. The provisions of Act 496. 31. The Land Registration Act. 32. The effect of this law in lowering interest and improving agricultural conditions.

33. The following statistics are taken from the census of 1918:

There are 88,086 farms in La Union with an area of 65,932.89 hectares, valued at ₱38,098,118. Of these farms 1089 are under Torrens titles, 2301 under royal titles, 3581 under possessory titles, 180 under judicial titles, 10,741 under private deeds, and 69,706 under no title other than mere occupation by those working them. Furthermore, 72,593 of them are worked by owners; the remaining 15,493 are worked by tenants, either under lease or rent, payment being made in produce, money, or labor.

In Rizal there are 29,994 farms with an area of 42,981.42 hectares, valued at ₱9,903,914. Of these farms 2137 are under Torrens titles, 675 under royal titles, 2309 under possessory titles, 462 under judicial titles, 6522 under private deeds, and 16,357 under no form of title other than mere occupation by those working them. Furthermore, 18,061 of them are worked by owners; the remaining 11,833 are worked by tenants under conditions described for La Union.

Display and compare these statistics, and on the basis of these data comment on certain economic differences in the provinces of La Union and Rizal.

34. A Committee on Customary Law has been appointed by the Insular Government. Compile some of the customary laws in so far as they affect commerce, industry, and agriculture in your locality. 35. Under what procedures have these customary laws been applied? 36. Could they be applied in the regular courts of the Philippines?

37. How might government bonded warehouses be of assistance to small landowners and to farmers of rice on shares?

38. Act 2865, passed by the Legislature in 1919, provides for a special committee to take charge of the investigation of controversies between the owners and tenants of large estates. Determine what the government has done to carry out the provisions of this law. In 1919 a committee was appointed by the governor-general to investigate and render a report on the tenant problem on an estate in Rizal Province.

39. Act 2508 and the organization and practices of Agricultural Credit Coöperative Associations.

40. Has your province organized any agricultural colonies on public land by authority of Act 2806? If so, have they been successful? If not, why?

41. In the table it will be noted that the average cost of educating pupils is gradually increasing. Explain why. 42. What percentage of the school population is receiving an education? 43. If the entire school population of the Philippines receives the same average education that is now being given to pupils actually in schools, how much will it cost the government? 44. Are the actual plans of the government wider in scope?

SUGGESTIONS FOR THE STUDY OF LOCAL CONDITIONS

1. Size of parcels of land. 2. If large plantations exist, explain how they are managed. 3. Systems of share holding, and the economic and social status of the cultivators. 4. Relations with proprietors. 5. Peasant proprietors, their economic and social status.

6. Examples of persons leaving the community to take up homesteads. 7. Examples of homesteads taken up in the locality. 8. Local interest rates on agricultural loans.

SUGGESTIONS FOR REPORTS FROM REFERENCES

1. Average size of Philippine farms compared with those of other countries. 2. The peasant proprietors of France, the backbone of the Republic.

3. In 1918 a strike of tenant farmers occurred in Bulacan, and many moved from the region affected to Nueva Ecija. If possible bring in a report of this or a similar occurrence and explain the fundamental causes, the results, and, in your opinion, the remedies which might have prevented it.

4. Lessons from the pioneer settlements of the United States which apply to Philippine conditions. 5. What the settlement of the Cagayan Valley, the Bukidnon Plateau, and the Cotabato Valley means to the Philippines. 6. Reasons why greater advantage of the Homestead Law has not been taken.

7. In 1913 you filed application for a homestead under Act 926. You have just been granted your Torrens title. Write a letter to a friend telling how you secured it.

8. You have been elected secretary of a corporation which proposes to lease land in Mindanao. Write a letter to the stockholders, explaining just what the directors of the company propose to do under Act 926 and the Corporation Law, Act 1459.

9. Look up the records in some local case of land title that has been fought through the courts, and bring in a report as to the points that arose, and that led to the decision granting the Torrens title.

10. Secure the data from the 1918 census, and prepare maps like those on Charts XXIX and XXX.

SELECTIONS ON THE THEORY OF ECONOMICS TO BE APPLIED TO THE MATERIAL IN THE CHAPTER

1. Rent. (Bullock, pages 279-291.)
2. Single tax. (Bullock, pages 324-330.)

CHAPTER XIII

AGRICULTURAL LABOR¹

Since nearly all labor in the Philippines is at present agricultural, and its problems differ from those pertaining to labor engaged in manufacture and commerce, agricultural labor deserves to be considered separately.

Statistics on occupations in the Philippines are often misleading; for the same individual frequently pursues more than one occupation. Agriculture is nearly always the chief employment,² but the income of almost all Philippine agriculturists is considerably augmented during the off-season and in spare time by fishing, trading, weaving, driving, and similar employments.

PHILIPPINE VILLAGE LABOR

The provinces of the Philippines are divided politically into townships, and these again into barrios with the *centro de poblacion* as the center. In most regions the people of the barrios are grouped into villages (*sitios*), consisting of clusters of from five to several hundred houses. In only a few places do the people live in isolated houses on the land they cultivate.

¹ In the economic sense of the word, labor is any physical or mental action which produces wealth. It includes not only manual labor, but that of supervision and direction. In the popular sense, however, the word does not include the effort of supervision and direction. In this chapter the word is so used, and refers to peasant proprietors, tenants for rent, and share and hired laborers.

² In the United States secondary production is not common; in the East and in parts of Europe it is quite general. In Germany twelve per cent of the persons engaged in agriculture, forestry, stock raising, or fishing have a second or third occupation (Buecher).

The founding of these villages can often be accounted for by economic reasons,¹ but political and social considerations have been even more potent. The persistence of villages has economic, political, and social significance.

It is supposed that the Malayan peoples came to the Philippines in boats called "barangays," under the command of a captain or pilot. The land in a settlement was apportioned among the families, and all continued to live under the direction of the chief.² These little communities were held together by the need of mutual protection against the depredations of neighboring villagers. After the conquest the Spaniards built on this system. They concentrated the people in villages to Christianize them and make their government easier, and also to protect them from bands which had not "come under the bells" and from the Mohammedan Moros of Mindanao and Sulu. A cause for the concentration of people in rice regions is that the flooded fields are not good places for houses, which are consequently clustered together on higher land.³

¹ See Chapter X.

² Compare with the discussion of Ilocano immigration on page 224.

³ The result of intervillage warfare in the Mountain Province is thus described by C. R. Moss, Division Superintendent in 1910:

Igorot villages have been settled in easily defendable spots, on account of feuds with neighboring people. The superstition of the Igorots in their primitive state is such as to lead to a ceaseless condition of strife between neighbors.

The practice of head hunting is a part of the religion of most wild Igorots. A head is taken from a village; the people of that village, to appease the spirits, are bound to secure a head from the offenders. The duty of collecting this so-called "debt of life" falls first on the relatives of the beheaded person, and is never forgotten.

Such a state of affairs naturally leads to open rupture between villages, and of course, since a village is likely to be attacked, it is advantageous that it be located in a place which is easily defendable.

In the northern subprovinces of the Mountain Province, under the vigorous rule of the provincial authorities, the practice of head hunting is being exterminated, but this attempt is so recent that thus far there has been very little migration from the old villages. On the other hand, in the southern subprovinces heads have not been taken for about two generations, and all the towns are at peace with each other. As a result, the villages are generally smaller than those of the wild peoples, and in their location agricultural advantages have been considered rather than facilities for defense. Their present tendency is to break up into smaller groups and form new villages in places suitable for agricultural work.

Similar agricultural village communities also exist in Java.¹ The land surrounding them is often undivided communal land used by all the members of the village. Sometimes it is periodically divided among the people. Some lands have fixed divisions and are subject to periodic assignment.

Certain public services must be rendered to the community or to the headman, which were originally a burden on the land rather than on the individual. This might best be expressed by saying that each person enjoying the use of a portion of the village domain pays his rent in personal services to the village. These services consist in building and maintaining roads, bridges, irrigation ditches, markets, cemeteries, watchhouses, and other public works; in guarding dikes and ditches in time of flood; in watch duty; and in certain personal services to the village headman, such as cultivating his ground, caring for his horses, bringing fuel, repairing his house and sheds, cleaning his grounds, and accompanying his wife to market. All these services are assigned and regulated by the headman or village chiefs, and usually may be bought off, like the road tax in America, for a fixed amount.

When the Spaniards came to the Philippines, they probably found some such system as this in the villages. A modified form of this system still persists on the island of Cagayancillo, in the Visayas, in Sulu, and among the Moros. It is approached in an organization reported, by Fred O. Freemyer, to exist among Ilocano immigrants in Pangasinan.

From four to twelve families come together. The houses are built within a common inclosure, and the land they farm is either owned or rented in common. If it is owned, the title is usually in the name of the headman, who assigns to each his share. If it is rented, the contract is usually signed by the headman only. During the planting and the harvesting the families work in common, but at other times each is given a particular part of the field to oversee. Such work as house-building and the digging of irrigation canals is usually performed in common, the one for whom the others are working being expected to provide a small feast with perhaps "basi" or "nipa vino." In case some members of the community do not own carabaos or other work animals, they are allowed to count two days' work as equal to one day's work of a man with a carabao. They are usually very fair with each other in their dealings.

¹ See *Bulletin No. 58*, Bureau of Labor, Washington, D. C.

These are the only instances known to the writer where communal land tenure is approached among the Filipinos. If it once existed, it has now disappeared. Group labor, however, is still found in villages. The Filipinos have been opposed to free group labor on public works, because they were so often made the victims of irregular official exactions. Nevertheless, in the last few years group labor has been used in the construction of schoolhouses, churches, bridges, and even for the building of roads. Group labor for the benefit of the individuals of a village is still widely practiced, though it is becoming of less importance. In a few districts it is not practiced at all.

Buecher in his "Industrial Evolution" divides labor in common (group work) into three kinds: companionship or fraternal labor; labor aggregation; and joint labor.

Companionship or fraternal labor occurs when several workers come together and labor without the individual's becoming in the progress of his task in any way dependent on the others. . . . The sole aim in union is to have the company of fellow workmen, to be able to talk, joke, and sing with them, and to avoid solitary work alone with one's thoughts.

The student whose work thrives best in undisturbed solitude will on hearing this probably shrug his sympathetic shoulders in pitying contempt, and find the subject hardly worth serious consideration. But anybody who has ever observed a group of village women braking flax, or doing their washing at the brookside, or watched a troop of Saxon field-workers hoeing turnips, or a line of reapers at work, or listened to the singing of a group of house painters, or of women at work in an Italian vineyard, will be of a different opinion. The lower the stage of a man's culture, the more difficult it is for him to stick to continuous and regular labor, if he is to be left by himself.

Thus fraternal labor accords very well with the economic principle, even though it originates primarily in the social instinct. In the company of others people work with greater persistence than they would alone, and in general, because of the rivalry, also better. Work becomes pleasure, and the final result is an advance in production.

By labor aggregation we mean the engaging of several workmen of similar capacity in the performance of a united task, . . . too heavy for the strength of one person. . . . Labor aggregation is of special importance for seasonal work or for work that is dependent on the weather. . . .

These circumstances have early led to a species of social organization of aggregated labor, founded on the duty recognized the world over of mutual assistance among neighbors. We may use the expression current among the southern Slavs and call it bidden labor. Whenever anybody has work to be done for which his own household is not adequate, the assistance of the neighbors is sought. They give it at the time without further reward than their entertainment, which the head of the house offers in the accustomed way, solely in the expectation that when need arises they too will be aided by their neighbors. The work is carried out in sprightly competition amid jokes and song, and at night there is often added a dance or like merrymaking. . . .

We come now to the last kind of labor in common, which we have designated joint labor. Certain tasks in production require for their performance the simultaneous coöperation of various classes of labor. . . . Since they cannot possibly be performed by one workman, several workmen of various kinds must be combined in one group to form an organized and indivisible whole.

Instances from agriculture are numerous. Thus in drawing in hay or corn, the load builder, the pitcher, the after raker, in binding, the binder and the gatherer, form natural groups; in mowing grain a second person is required to glean; in digging potatoes another gathers them up.

In the Philippines labor in common is often performed with the understanding that the beneficiary will work in a like manner for each member of the group, plowing and planting fields in rotation, for instance, and harvesting the crops. The beneficiary of an unusual piece of work, such as house-building, recompenses the laborers by providing for them meals of extra quality and quantity, and by amusements. Such a time is made the occasion of a fiesta.

In the Philippines labor in common is often put on a permanent basis of reciprocity into which the elements of lottery, insurance, and banking enter.¹ The most common form is in connection with many of the village economic activities, such

¹ The data on this subject were turned over to Conrado Benitez, Instructor in Economics in the University of the Philippines, who prepared this discussion. Reports on the "turnuhan" of Majayjay, Laguna Province, by Getulio Vitasa, and on those of Cavinti, Laguna Province, by Petronio Perez, deserve special mention here.

as making kaingin; plowing, planting, harvesting, threshing, and husking; building houses; making hats; in fact, doing any work which the member whose turn it is wants done. These "turnuhans," for such we shall call them, are not regular associations with formal rules and regulations. They are simply spontaneous associations of persons with a common aim to help each other, and different places have different practices in regard to details. In the town of Cavinti, in Laguna, for example, help is given to one of the members once a week. Those who fail to help must work alone some other day, or give an equivalent in money, namely, half a peso. The man who was expected to work with a carabao must pay a peso and a half in lieu of service. This payment of money in place of service is a modern development, as shown by the fact that in the original "suyuan" to pay money is considered a breach of good manners; for the word "suyo" means favor, and to pay for a favor is, of course, improper.¹

In some towns where hats are made the women help each other. Sometimes the materials are supplied by the members themselves; in other cases the one for whom the finished hats are intended supplies them. There is always a fixed minimum number of hats to be made by each member, and anybody failing to contribute this number pays the value in money.

In regard to food for members during the work, practices again differ. In some organizations members furnish their own food; in others they are fed by the beneficiary.²

¹ Again, this idea that it is improper to receive money for a favor survives even to-day among the servants (not the modernized ones who have seized upon the idea of a tip), who, ashamed to take money from the family guests ordinarily, do so when told that it is for cigarettes or buyo. In fact, to-day, when tipping, it is good manners to say "for tobacco or buyo."

² Group labor, as originally found in the labor turnuhan, has recently shown an interesting development in the provinces of Tayabas and Laguna, where money turnuhans are being established. The money turnuhan is an association run according to by-laws subscribed to by the members. These require a contribution of money at regular intervals, usually every Sunday, the sum collected to be given to one of the members chosen by lot. The turnuhan runs until every member has drawn the prize. A successful member cannot draw again.

The turnuhans are run in about the same way everywhere, for the constitutions adopted in different towns are mere copies of the original from Lucban, in Tayabas. The number of members ranges from 25 to 500, the usual number being between 25 and 50. One exists in Majayjay which has 1000 members, but these are divided into five sections of 200 each, and each section is run like an independent organization. The management is ordinarily in the hands of a director, but for the larger turnuhans there are three officers, the director, the secretary-treasurer, and the inspector. The amount of individual fees ranges from ₱0.20 to ₱1.00 weekly. The number of years that a turnuhan runs depends on its size. From one to five years is the usual time limit, but some turnuhans must run nineteen years before all the members can get their money back.

The manager is granted special privileges for his services. In many turnuhans he receives the first drawing. In all of them the winner pays a certain percentage of his prize (from one to two per cent) for the expenses of management. The turnuhans make provisions for their protection. Members failing to pay their dues after a certain number of weeks lose what they have paid in, and the money thus collected is distributed among the members at the end. If a member dies, his share is usually given to his heir, who continues to pay the dues. In some cases the deceased's share is turned over to the turnuhan. Members who have drawn the prize are not paid the full amount due them; some turnuhans retain three fifths of it as security against noncontinuance of payment. Others simply require two bondsmen before the whole sum is given the winner. A feature of life insurance present in some of the turnuhans requires that the lot must be given to the member who has suffered a great misfortune, such as death in the family.

Where money turnuhans are well managed, they have proved to be beneficial to the community, for they have encouraged the habit of saving. They have furnished the members with ready capital, which is reported to have been invested in productive enterprises, such as the buying of carabaos and the planting of more lands. Others have used their capital in repairing their houses, and still others have been able to pay their debts with it.

The labor turnuhan keeps the members working, and nearly always results in some permanent improvement, such as rice fields, houses, and the like.

Another common form of group labor in the Philippines is in connection with social activities, as distinguished from the economic activities mentioned above. These activities partake of the nature of mutual insurance in the help

rendered the members of the community. Help is given at baptisms, weddings, and burials. In the case of funerals the work involved is the making of the coffin and the preparation of the food for the friends. So long as a person does a slight bit of work, he is considered to have given his *abuloy* or *ambang*. Help, moreover, may take the form of money or of goods, the latter usually being eatables for the many guests. The amount of money or of goods given varies with the individual.

The courtship of a woman is frequently the cause of many forms of group labor, and the activity that results therefrom may be classed as economic. A group of young men may decide to help the woman in husking rice. Here we have the beginning of a socializing activity, for usually the person helped prepares something to eat, and everybody has a merry time, especially when there are music and singing to keep time with the pounding.

An interesting form of group labor in connection with either death or marriage is that performed by young men. If any member dies or marries, the others contribute a sum of money previously agreed on. Besides the money, they give commodities, such as wood for fuel, and render service at the feast, such as getting water and waiting on the table. Any member who fails to fulfill the requirement is fined by being charged double the regular contribution; the fine must be paid within one week after either the funeral or the wedding, as the case may be. The members, in every instance, are supposed to furnish the transportation required.

Still another form of group labor in the village is the banding together of citizens for protection against fire and robbers. This was common during the Spanish administration; it is still found in its original form in many towns. The frequent Moro raids in the past made this kind of group labor necessary. The private night patrol, or *ronda*, used to be a common feature of Philippine life; it is said to exist still in some towns. There the adult male citizens take turns in

performing this duty of watch. Volunteer fire associations have been organized, as now provided for by law.

In comparison with the system of isolated farms scattered over the country, as found in Cuba and Porto Rico (countries possessing similar products and economic advancement), the Philippine village system has points both for and against it:

1. It permits of group work. This, however, may not always be beneficial, since it does not promote individualism and independence in the Filipino agriculturists.

2. New thoughts and ideas are more easily promulgated, and news travels more quickly.

3. Children can reach their schools more easily.

On the other hand, much can be said against the village system:

1. Time is lost in going from the home in the barrio to the fields. This may amount to several hours daily. In many places this disadvantage is partly overcome by a temporary hut built at the field for the planting or harvest season.

2. The sanitary problem is always an important one where people are congregated.

3. In the scattered-farm system there is less temptation to fritter away time in social intercourse, in the cockpit, and the like.

4. The production of supplementary farm products (poultry, eggs, fruit, and the like) is greater on scattered farms.

5. In villages the danger from fire is great.

Philippine agricultural villages are gradually being broken up, the scattered-farm system being adopted. There are certain districts in the Islands in which the village system has never existed, at least not for centuries. Two small regions of scattered farms are found in Tarlac Province. The coconut regions of Laguna and Tayabas are chiefly settled in that manner. Scattered farms predominate in Marinduque, Oriental Negros, Bohol, and a part of Cebu. The Carcar-Barili district of Cebu is probably the largest single region. It seems that the village system was not established here by the Spanish

government because the people could easily be protected and controlled. It is now densely settled, and the distance from house to house is slight.

The village system persists in the Philippines largely because of custom, the gregarious nature of the people, and ties of relationship. The family and clan feeling is very strong, as can be seen in the grouping of students from the same town at provincial capitals and at Manila. The Filipino family joins, in a sort of family feudalism, even the relatives who have moved to a great distance. It is obliged to look after all its members and to provide charity such as is dispensed by organizations in industrial countries.

The village system holds its own in the outlying parts of the Islands and in regions in which the land is divided into small scattered plots tilled by peasant proprietors under the interleasing system, such as the Ilocano provinces. In other places scattered farms are gradually increasing with the establishment of greater security. New settlers are building houses on their farms, and there is a gradual movement away from the villages along newly constructed roads.

EFFICIENCY OF LABOR

Efficiency of labor depends on the inherited strength and characteristics, the standard of living, and the education and training. In preceding chapters (particularly in Chapter XI) the methods by which advance in agriculture will result in larger production per hectare are discussed. In this chapter the question of larger production per man is considered.

INHERITED STRENGTH AND CHARACTERISTICS

His physical, mental, and moral qualities all affect the amount of wealth produced by the laborer, and these depend largely on inheritance and training in early childhood. It is a significant fact that the child usually follows the occupation of his father, and so he is expert in his particular kind of

work. This is especially true of production requiring considerable skill. For instance, it used to be said that a good cutter of velvet was only produced in the second or third generation. The Filipino is especially strong in the shoulders, and can lift and carry better than he can perform other unskilled labor. He also shows great dexterity in handicraft, the fineness and evenness of which excite admiration. In Hawaii, where peoples of all nationalities have been gathered as laborers, the Filipinos are considered especially good for light work; on heavy work most of them are not satisfactory. They seem to be slower than the Japanese.

That many of the physical disabilities of the Filipinos are due to the same causes which produce the high rate of infant mortality in the Philippines, there can be no doubt. If a child is born weak and is poorly nourished during the first few months of its life, it will not grow into a strong man or woman. The death rate per thousand in Manila during the year 1917 was as follows:

	1917
Spaniards	10.44
Americans	7.12
Other Occidentals	9.96
Chinese	14.70
Filipinos	26.67

This excessive death rate among the Filipino population is due to the high mortality of children. Sixty-five per cent of these deaths are of children under five years of age; forty-nine per cent, of infants under one year of age. The following table is a comparison of the infant mortality in Manila with that in the United States and France:

	PERCENTAGE OF TOTAL DEATHS
United States	18.28
France	20.
Manila	48.8

In France and the United States the greatest mortality is among children who are artificially fed ; in Munich, Germany, eighty-three per cent, and in Berlin ninety-one per cent, of the infant mortality occurred in artificially fed children. The opposite is true in the Philippines, where seventy-four per cent of the total infant mortality occurs among children who are nursed by the mother. Eighty-seven per cent of the infants dying of beriberi and convulsions (malnutrition) in Manila are nursed by their mothers. This means that the improvement of the physical condition of the Filipino mother is an important economic question, not only to reduce the infant mortality, but to increase the physical strength of children that live. This can best be accomplished by reducing poverty and providing sufficient and suitable food. If good, pure cow's milk can be provided, great improvement will result. The splendid work done by the Gota de Leche Society in Manila shows what can be accomplished by scientific feeding of infants with pure milk.¹

THE STANDARD OF LIVING

While his start in life has an important effect on the physical and mental efficiency of the laborer, the standard of living which he maintains is of much more importance. As has been stated, on the plantations in the Hawaiian Islands it is noticeable that Filipino laborers are at first incapable of doing heavy work, and few are employed on heavy loading contracts. However, with change of food and methods of living they are gradually taking their places in all parts of the plantation, even, to some extent, in the mills, where the heaviest work is done.

Food

The chief uses of food are, first, to form the material of the body and repair its wastes ; secondly, to furnish the energy for the work that the body has to do ; and, thirdly, to yield heat to keep the body warm. The proteid foods are the principal

¹ Data from annual reports of the Director of Health, Manila.

tissue formers, and make the framework of the body. They are also burned up in the body like the carbohydrates, and thus render important service as fuel. Fats and carbohydrates are the chief fuel ingredients of food. Sugar and the starch of sweet potatoes and rice are burned in the body to yield heat and power. The fats, such as the fat of meat and butter, serve the same purpose, only they are a more concentrated fuel than the carbohydrates. The different nutrients can, to a greater or less extent, do one another's work. If the body has not enough of one kind of fuel, it can use another. But, although the proteid can be burned in the place of fats and carbohydrates, neither of the latter can take the place of the proteids in building and repairing the tissues. Proteid occurs most abundantly in animal foods, namely, meat, fish, eggs, and dairy products, and in dried legumes such as beans and peas. Butter and lard are the chief animal fats, and coconut, olive, and cotton seed the most important vegetable oils. The most common edible nuts also contain considerable fat. The carbohydrates, unlike the fats, are almost entirely absent from the animal foods, except milk, but form the most important nutrient of most vegetable foods.¹

In the arctic regions, where heat is of prime importance, fat, blubber, and fish are eaten almost exclusively. The inhabitants of the temperate regions are accustomed to a mixed diet of meat, fish, and vegetable matter, the amount of the former depending on the wealth of the people and the density of population. In the tropics the diet is largely vegetal, with a good deal of fish and a small amount of meat. The kind of food must necessarily depend on the vegetable and animal life available. Along the coast fish is eaten; in the interior less fish is obtainable, and beans and similar vegetable foods, high in proteids, are often substituted.

Besides foods producing energy and tissues, the body requires certain quantities of mineral substances, especially

¹ W. O. Atwater, in *Farmers' Bulletin No. 142*, United States Department of Agriculture.

salt, lime, and phosphorus. All peoples use narcotics and stimulants, not as nourishment to the body, but for their effect on the nervous system. Such are spices, alcoholic liquors, drinks from beverage crops, tobacco, buyo, and opium.

The domestic vegetable foods which form a part of the Philippine diet have already been fully discussed in the chapters on food crops. The problems with respect to these are (1) to increase the local rice crops, and so make the Philippines less dependent on the foreign food supply and provide abundant food for the whole population; (2) to increase the yield and use of corn as the chief food or as a supplementary food to rice; (3) through bean crops to provide another source of proteid, which is now obtained almost entirely from fish and meat; (4) to increase the amount of food in those regions in which restricted diet annually occurs; (5) to give greater variety to the Philippine diet in all directions possible, and especially in the amount of fresh fruits and vegetables consumed.

Proper amounts of fish and meats may also provide the necessary proteids. The fishing industry is discussed in Chapter XV, where it is shown that in general the demand for fish is not supplied, and that it is doubtful whether modern trawlers and equipment can be introduced to increase the supply. The inhabitants of the Philippine coasts eat fresh fish; sometimes the surplus catch is dried. Bagoong is the form of preserved fish most consumed along the seashore, and especially in inland towns. It is essentially raw fish mixed with salt and allowed to ferment for days, months, or even years. Its nutritive portion is mostly proteid; but since it is badly prepared and contains essentially decayed animal matter, it is not a good food. The quickest and most practical way of providing a sufficient amount of proteid for the diet of the Filipinos is to encourage the growing and eating of beans, as has been suggested in Chapter IV.

Pork is the principal meat consumed, and is found in all Philippine markets. The amount available can be increased

by the systematic raising of hogs for the market and by improving the breeds. Very little beef is now eaten by the Filipinos, since few cattle are available. If rinderpest can be held in check, the number of cattle in the Islands will possibly increase sufficiently to furnish a supply of beef adequate to the domestic demands. The present situation is relieved to some extent by importing chilled or cold-storage beef from Asia and Australia (see Chapter XIV), and beef cattle from Asia.

The alcoholic liquors consumed by the Filipinos may be divided into two classes, distilled liquors and the fermented juices. In the fiscal year ending 1917 there were produced in the Philippines, according to the Collector of Internal Revenue, 14,000,000 proof liters of spirits, distilled from the sap of the nipa and coconut palms, and from sugar and grain. This is an average of 1.4 liters per capita for the Islands. In addition great quantities of tuba, the fermented sap of the coconut palm, are consumed in the Visayan Islands, and a considerable amount of basi, a drink made from sugar cane, among the Ilocanos.¹

The Filipinos are much greater consumers of tobacco than of alcoholic beverages. In the fiscal year 1917 there were consumed in the Philippines 104,000,000 cigars (10 per capita) and 4,400,000,000 cigarettes (440 per capita). The chewing of buyo is also widespread, although it is much less prevalent among the rising generation. The smoking of opium, which threatened to become general, has been prohibited by law. Both coffee and chocolate are common drinks, particularly for the morning meal.

The Filipinos do not have a sufficient variety of food. Too often the laborer is content with a pot of rice or corn and a little salted or dried fish, with now and then some greens. Some even eat plain corn or rice three times a day. Some eat but two meals a day. An instance is on record of

¹ Most imported spirits and wines and the domestic beer are consumed by the foreign population.

a population of 88,000 persons among whom one beef and twenty hogs are killed weekly. This population is described as being generally improvident, making little provision for the morrow or even for the next meal. Under such conditions the laborer does not receive enough nourishment to sustain his body properly and permit him to labor efficiently. Such a description pertains to the lowest type of Philippine laborers and to the most backward communities. Against this type may be placed agricultural laborers who take pride in a full granary, who have considerable variety in their meals, and who in general are good liver and workers. Place the ordinary Ilocano beside certain of the people to whom he emigrates, and the effect of his superior food will appear in his ability to outwork those with him.

Wherever Philippine constabulary or scouts are quartered among the poorly fed population, their superior endurance and strength are at once apparent. The Hawaiian Sugar Planters' Association report that the majority of the Filipinos who come to them have never been accustomed to work; that they come poorly clothed and ill fed; and that it requires a considerable amount of time to build them up properly for the work required.

With improvement in economic conditions in the Philippines the amount and the quality of food have increased to a less extent than other factors in the standard of living. However, there has been a tendency in the right direction. This has been particularly noticeable with respect to flour, the importation of which shows a steady increase. There are now few towns in the Philippines which do not possess at least one bakery, and bread with coffee or chocolate is the customary morning meal of a large portion of the inhabitants of the Philippines. On account of the ease with which it is packed, bread is gaining favor as an article of food carried by travelers and used for lunches in the field. The importation of potatoes is steadily increasing, and this vegetable is now found in the stores of most provincial towns. The

same may be said of onions. The stores are offering an ever-increasing selection of canned goods, which are consumed daily and are always bought in quantities for fiestas. Recently the importance of vegetables has increased in the diet of the Filipinos (see Chapter IV).

Housing

The houses in cities were formerly built of soft stone; a few modern houses are now being constructed of stone, brick, or concrete, with tile or galvanized-iron roofs. The houses of the rich and well-to-do are often built of hard woods, with galvanized-iron roofs. Most dwellings, however, are made of bamboo, with sides and roofs of nipa thatch or, in inland regions, of grass. The latter may be called the Filipino or nipa houses. The proportion of these dwellings differs in various agricultural communities. In Samar, where much property was destroyed in war times, nearly all the houses are nipa. In modern rich towns, like Pagsanjan, in Laguna Province, the number of wooden houses is rather large. Generally speaking, the town center has a few hard-construction houses, whereas the barrios are built entirely with bamboo and nipa.

Nipa houses are often constructed with one room; many have three rooms, some five or six; probably the majority have two. In view of tropical requirements for health and the wealth of the people here, these are ideal houses for the Philippines. According to the Director of Health, if nipa houses are properly constructed with sanitary kitchen and drains, they are the most sanitary dwellings that can be built in the Philippines. The old houses of solid masonry retain dampness. The nipa house soon becomes dry. The well-ventilated nipa house is cool and less apt to harbor germs and disease, since it is exposed to the desiccating air currents and the germ-killing power of sunlight. The chief objection to the nipa house is its inflammability; where houses are grouped together, whole blocks are soon burned. The fire is

usually communicated from one house to another from the roof; hence the government is offering prizes for a substitute for nipa roofing which will be cheap, light in weight, and yet fireproof. Cement tiles have been used with some success.

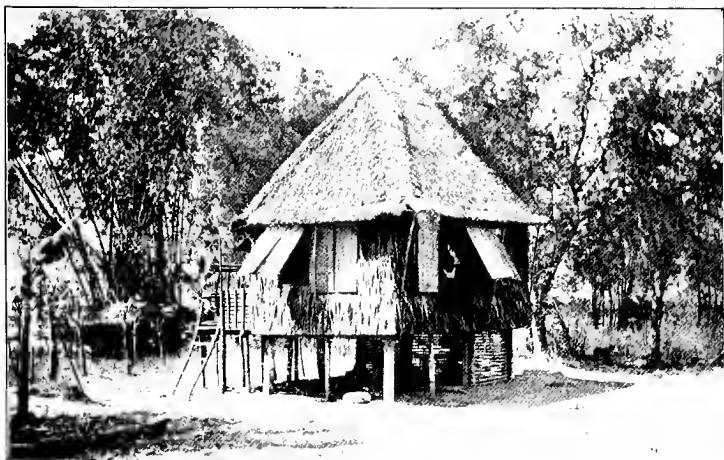
The problems connected with Philippine housing can be summarized in the one term *sanitation*. This is concerned with the ventilation of the rooms, the disposition of sewage,



ONE TYPE OF PHILIPPINE HOUSES

the draining of lands about the house, the water supply, and the vending, preparing, and eating of foods. Lack of attention to these matters not only increases the death rate, but affects the physical condition of the people.

According to official statistics, out of 7910 deaths in Manila in the year 1917 there were 1448 caused by tuberculosis of the lungs. This death rate from consumption is approached only by the city of Calcutta. Although tuberculosis is most prevalent in Manila, it is widespread in the Philippines. It is even stated that there is scarcely a single family which has not one member a victim of the disease. Conditions for the spread of tuberculosis are perfect in those



TYPES OF PHILIPPINE HOUSES

parts of the Islands in which there is overcrowding in unsanitary houses built close together in unsanitary places. Moreover, the free access of air, which the construction of the nipa house so well permits, is usually shut off by the Filipino family, since windows and doors are closed at night. Often as many as ten persons sleep in one room, with one or several individuals suffering from advanced pulmonary tuberculosis.¹

Organized efforts to combat consumption (antituberculosis work) have already been carried on in Manila for some time, and are now taking effect in the provinces through the schools and other agencies, chiefly the Antituberculosis Society.

The energy of the government has heretofore been chiefly spent in combating the dangerous communicable diseases, cholera, smallpox, dysentery, and leprosy. These are now held in check, and more attention can be given to the improvement of general sanitary conditions. According to the Director of Health, conditions on the Islands are better than they have been at any time in the last fifty years; in comparison with other countries it may be said that the Philippines are healthy. By means of quarantine infectious diseases have been kept out; trained health service has been able to isolate and quarantine infected regions within the country. Towns and cities have been cleaned up. There are now a thousand artesian wells in the Islands, furnishing pure drinking water; and water works have been installed in several cities and towns. Furthermore, the Filipinos have changed their attitude with regard to sanitary measures; for where formerly they hindered the health officials, they now assist them, knowing that what is being done to combat and prevent disease is being done for their own welfare. Proper medical attendance, which has been lacking, is being provided through medical schools.

¹ From an article by Drs. W. E. Musgrove and A. G. Sison in *Philippine Journal of Science*, Vol. V, No. 3.

Clothing

In the temperate zones, during a large part of the year, clothing is required to keep warmth in the body and protect it from dirt. Clothing in the tropics has the latter use to an even greater extent, on account of the presence of a greater number of bacteria; with respect to temperature, its use is to protect the body against heat. The clothing of the Filipino agricultural laborers is now well suited to their needs. It consists essentially of a broad-brimmed hat and of an upper and lower garment. Professor H. D. Gibbs, from his investigations on sunlight, in the Philippine Bureau of Science, has reached the conclusion¹ that the ideal protection for the body in the tropics is doubtless an umbrella, under which the subject is constantly in the shade, and the radiation and evaporation of perspiration are unobstructed; and that it is remarkable how the broad hat and scanty, loose garments of the native in the tropics approach this form of protection. However, good clothing is often worn for the pleasure it gives the wearer, and the requirements of the Filipinos have increased in greater proportion here than elsewhere. The Filipinos as a race desire to appear neat and well dressed. Hence much imported cloth, such as drills and calicoes, is worn; the use of shoes, even among the agricultural laborers, is now rather widespread; where a few years ago shoes were luxuries, they are now necessities.

Amusements

Relatively to his requirements for physical well-being the Filipino laborer has greater physical pleasures than the laborer in America or in Europe. He is materially better off than the laborer of Porto Rico or Java; for in the latter countries the great pressure of the population places before the poor man the unwelcome choice between constant toil and insufficient

¹ From "Original Communications, Eighth International Congress of Applied Chemistry," XX, 176.

nourishment.¹ The amusements of the Filipino may be enumerated as follows: gambling (at cards and other games, and at cockfights), fiestas, music, dancing, sipa (a game played with a rattan ball), and new amusements (such as phonographs, cinematographs, and the like). The degree to which these amusements are enjoyed by the people is not the same throughout the Islands. Mr. Gil Raval, writing from Ilocos Norte in 1910, reports as follows:

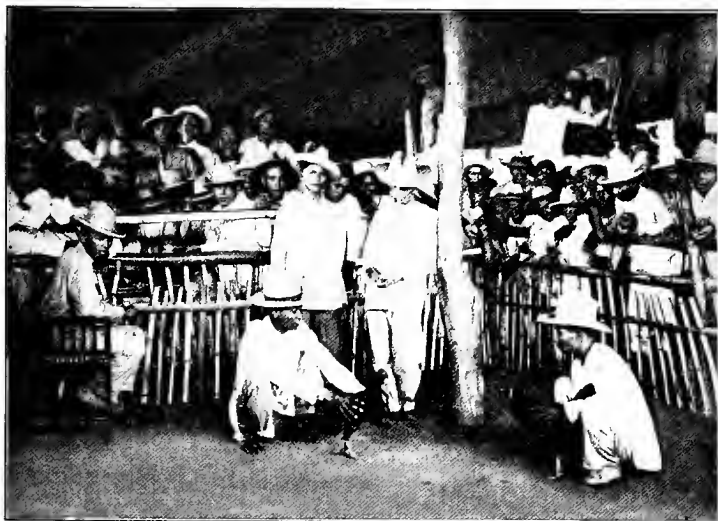
Their amusement is almost nothing. Drinking too much basi or wine at a wedding or christening party, and dancing and singing in the rice fields during rice harvest, are regarded by them as their most enjoyable times outside of Christmas and the Fiesta of the Patron Saint of the town, when there are fireworks and "moro-moro." The farmer's wife has another kind of amusement. It is her great delight to go to church on holidays and to market on market days. She wears her Sunday dress, and on her head puts a finely woven basket full of vegetables and other things to be sold in the town. With the money she will surely buy several skeins of brightly colored cotton thread and one or two coconuts. Gambling with cards is unknown to these people. Cockpits in this region are not very well attended by farm laborers as compared with those in the southern provinces. It is safe to say that about ninety-eight per cent of the attendance in the pits here consists of those town people who follow gambling either for amusement or for their living.

The following, however, describes other conditions:

The bulk of the money received goes for ceremonials, weddings, baptisms, and such fiestas, at monte, the cockpit, and the like.

Cockfighting is not a sport for sport's sake, nor even for the sake of seeing blood shed, but a game of chance. Cockfighting, cards, and lotteries were previously encouraged; the Filipino's desire for games of chance is largely a question of custom and inheritance. It is widespread among all classes. According to the authorities of the Hawaiian Sugar Planters' Association the Filipino is the foremost gambler of the various peoples there; out of the one hundred and thirty-six convictions of Filipinos in the district court of Honolulu eighty-two

¹ *Bulletin No. 58*, Bureau of Labor, Washington, D. C.



A COCKFIGHT



ATHLETIC GAMES
OLD AND NEW AMUSEMENTS

were for being present at gambling games. The ill effects of gambling on the mental and moral qualities of a people are marked. The effects on economic conditions are just as great. The desire of the devotee of cockfighting and gambling at cards is not only for diversion, but for money easily gained. His hope is to obtain in a day what would ordinarily take months or years of drudgery to earn; often to win freedom from a debt which holds him bound to the land. On the other hand, gambling is often the very cause of such a debt. A large population dependent on gambling for a living offers a bad example of comfortable idleness to the productive agricultural laborer. In addition there is great economic waste connected with cockfighting in the time and energy spent on raising and training the cocks and on the food provided them. The immediate effect of this can be seen in the inferior condition of Philippine poultry (see Chapter XIV). As early as Pigafetta's time the evil effects of cockfighting are noted.

The sums of money that pass hands are large in proportion to the means of the gamblers. It is evident that this sort of diversion demoralizes more and more a people which is of itself given to idleness and vice, and which is easily led by the impressions of the moment. The people cannot resist the temptation to get money without working for it. Many load themselves with debts on account of the losses which they suffer; the bandits and pirates are in great part ruined gamblers.

Among the younger generation gambling is of much less importance than with the older people; even among the latter it has decreased because of the sentiment aroused through schools and organizations, and because of laws prohibiting lotteries and games of chance, and regulating cockfighting. However, people must have amusements; if one is taken away, another must be substituted. Through the schools athletic games are being given to the people; these games will in time probably supersede cockfighting, while better homes, higher standards of living, and widespread social life will lessen general gambling. Greater economic effort and interest in production will diminish the amount of idle time

and the necessity of seeking amusement. It is noticeable that least gambling is reported among peasant proprietors. The adoption of baseball by the younger generation, as well as the interest in it manifested by parents, is a remarkable achievement; throughout the Islands the effect of this and of field sports is noted in the decreasing attendance at the cockpit. Besides substituting a clean sport for cockfighting, athletics will improve the physical condition of the Filipinos, and give both participants and spectators an idea of system and of unity.

The feasts observed by the Filipinos are both public and private. They occur on holidays and in the observation of marriages, christenings, and the like. When such ceremonials are carried to the extreme, the time lost may be considerable, and the amount of food consumed is often sufficient to feed a family for several months. A family sometimes spends its entire wealth on a fiesta, and even contracts a debt at heavy interest. Recently school and industrial exhibits, and fairs, have become popular, inasmuch as the industrial idea has been established.

Many forms of amusement are finding a place in the Philippines. Among the most important are the phonograph and the cinematograph, both of which are now recognized the world over as excellent and instructive. There are few large Philippine towns in which the cinematograph is not found.

Summary

The standard of living has been raised much in the last ten years; this is perhaps manifest to the greatest degree in the better quality and the greater amount of clothing used, and in the higher forms of amusements; the careful observer sees advances in housing and food also. More strong-construction houses are being built; sheet iron is being substituted for nipa roofing; and cement houses are seen here and there. There is greater demand for tools, cutlery,

and the like. More furniture is found in the houses. Kerosene lamps have been substituted almost everywhere for the dim, open coconut-oil lamps. Pianos, automobiles, sewing machines, and clocks are common. Chart III indicates that the Filipinos are actually eating more rice per capita. Chart XXXII shows that in the years from 1900 to 1917 the

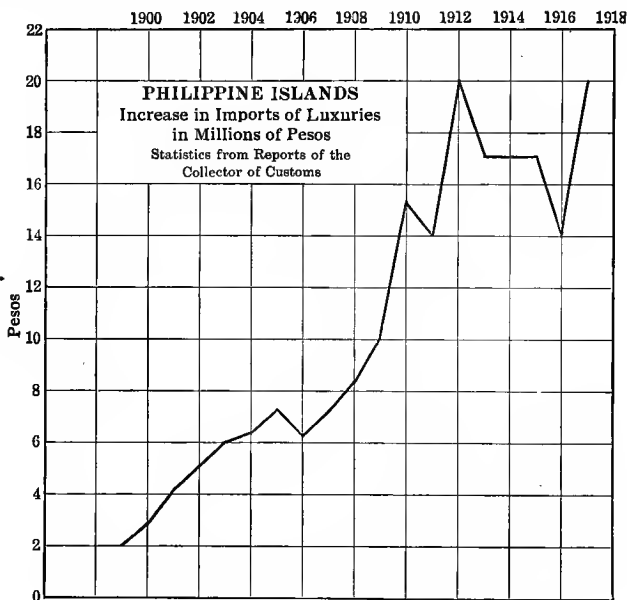


CHART XXXII. INCREASE IN IMPORTS OF LUXURIES

imports of what had been luxuries for the Filipinos increased almost tenfold.¹ During the same period the total imports only trebled.

This elevation of the standard of living has come about (1) through greater production and a larger portion thereof received by the laborer, (2) from general education, (3) as

¹ The dates and the articles selected preclude the possibility that the increase in these products is consumed by the foreign population.

the result of travel, and (4) from the example of returned travelers and strangers. It is seen in all classes, but chiefly in the middle class now springing up.

EDUCATION AND TRAINING

Walker in his "Political Economy" states that the intelligent laborer is more useful than the unintelligent for the following reasons:

(a) Because he requires a far shorter apprenticeship; he can learn his trade in a half, a third, or a quarter of the time which the other requires; (b) because he can do his work with little or no superintendence; he is able to carry instructions in his mind, and to apply them with discretion to the varying conditions of his work; (c) because he is less wasteful of materials; (d) because he readily learns to use machinery, however delicate or intricate. Brains are not alone required for the invention of machines; they are required for their adjustment, their ordinary use, and their occasional repair.

The Filipino laborer is lacking in education and training. In Hawaii it is found that he is so unaccustomed to work, and is so ignorant of the customs and conditions found there, that it requires a considerable amount of time to train him for the work on the plantations. In the Philippines it is now recognized that the laborer accomplishes a good day's work if he is intelligently supervised, but that he requires a foreman to keep him busy and show him what to do. In other words, he is lacking in system. The reason is that he has had open to him few kinds of activity other than the agricultural, from the most primitive times. Therefore, when he is required to do work which needs more intelligence and the use of modern implements, he is at first inaccurate. His final success in competition with other nationalities in the Hawaiian Islands, and the satisfaction which he gives not only on modern estates in the Philippines, but on public and private works, has demonstrated, however, that by training he may become an effective laborer.

DIGNITY OF LABOR

The ideas of a people as to dignity of labor in general and of certain forms of labor in particular are not the same, but are principally the result of local conditions. This is evident in the case of the Filipino. The older generation of the Filipino deemed any kind of physical labor a lowering of social position, an idea doubtless obtained from medieval standards during the colonization of the Philippines.¹ The Filipino thought himself elevated socially when he was able either to direct manual labor without doing it himself, or to do work which did not soil his clothing. Up to the last few years almost the only form of manual labor found in the Philippines was agriculture, and the agriculturist was to a greater or less degree bound to the soil. Thus the manual laborer was looked down on; indeed, he himself felt that he was inferior, and thought that if he could acquire enough land to live without labor or could become a clerk, his position in life would be much more agreeable and his class higher.² Soft hands and soft muscles, and a life of ease without responsibilities, were the end to be attained. Education, policy, and example taught this. These marked the "illustrado," the man of dignity, education, and affluence. They set him apart from the producers of wealth as a person to be respected and perhaps feared, one to be envied and imitated.

¹ To obtain an idea of the dignity in which manual labor was held in Spain during the time of its greatest influence on the Philippine character, Le Sage's "Gil Blas" should be read. This picaresque romance gives an idea of conditions existing at that time.

² In certain countries of Europe and in Japan, where the feudal system once existed, this feeling still persists. In new countries such as the United States and Australasia manual labor is not looked on as degrading, nor does the farmer or mechanic feel himself inferior to the man who works in an office, or who directs others. Greater wealth and the possibility of obtaining a living with less work are striven for, but the laborer is not considered inferior, nor does he feel inferiority. This condition, the willingness to submit to discipline, and an equal opportunity to advance, are the foundation of democracy.

The Filipino, therefore, has considered labor, and particularly manual labor, undignified. It is interesting to note the relative dignity which he attaches to the different kinds of effort open to him. The following lists are the result of observations made by different persons:

In general

1. Lawyer and doctor.
2. Government employee.
3. Merchant.
4. Big landowner.
5. Independent farmer.
6. Fisherman. (Ranks higher than 7 because independent.)
7. Tenant farmer.
8. Water carrier.
9. Road worker, laborer in general.
10. Street cleaner.
11. House servant, "muchacho."

5. Pruning.

6. Abaca stripping (servant).

In Cebu

1. Official.
2. Teacher.
3. Clerk.
4. Farmer.
5. Fisherman.
6. Tubá gatherer.
7. Servant.
8. Wood vender.
9. Grain vender.

In Moro

1. Sailor.
2. Diver.
3. Boat builder.
4. Carpenter.
5. Agricultural laborer.

In Sorsogon

1. Office worker.
2. Foreman.
3. Farm worker.
4. Road worker.

The fact that the Filipino was so long excluded from clerical positions has given to these an enhanced value in his eyes. Nevertheless, the Filipino really prefers agriculture to other kinds of manual labor, principally because he has always been used to it. Agricultural labor necessarily has little dignity in it where the worst phases of the kasama system exist; but in many places it is considered honorable when independent. Respectability usually rests more on the ownership of land than on anything else, and a family tries to belong to the landholding class even if the ownership embraces only a barren hillside. The Filipino prefers agricultural work not only because he is used to it, but because it offers

him greater freedom than routine work ; it allows him to work in the early morning and late in the day, and to rest during the heat of midday ; it is often nearer his home, and by having no boss over him he can work according to his own inclinations. The Filipino laborer will often refuse day labor on roads or other constructions, to go to work in the fields at even half the wages. Some forms of agriculture, such as rice planting and harvesting, seem to be held almost in veneration ; in places it has been practically impossible to get men to do any other kind of work during the agricultural season.

In the last few years the Filipino's ideas of manual labor have changed greatly. There is a general concurrence in this opinion in every part of the Islands. This change has undoubtedly been brought about by democratic examples, by the teaching of democratic ideas, and by the greater opportunity and measure of reward offered to the laborer. In the more advanced agricultural regions the wealthier farmers and proprietors are not ashamed to be seen in working clothes superintending the farm or even doing work on it. In the schools and industrial exhibits the dignity and the value of work have been emphasized. When the common schools were first established in the Philippines under the American régime, family servants often carried the pupils' books to school. Students generally expressed great distaste for any kind of industrial work. This was a reflection of the ideas of their parents on the aims of education and the dignity of labor. To-day, however, this dislike of industrial instruction is not evident even with respect to such forms as gardening and growing corn, which necessitate work in the soil. The causes responsible for the almost revolutionary changes in the Filipino's attitude toward manual work in general, and agriculture in particular, may be enumerated as follows : (1) change from the medieval to the American point of view ; (2) change in the aims of education ; (3) industrial work ; (4) inflow of capital, giving wider opportunity for employment in various kinds of industrial effort ; (5) greater

protection afforded to the laborer in the reward for his labor ;
(6) increase and diversification of wants.

Decrease in the drudgery of agriculture by the adoption of better methods and more machinery will enhance the dignity of this occupation.

REWARD FOR LABOR

BONDED DEBTORS¹

There are two classes of persons held by debt in the Philippines, the household servants and the ordinary laborers. The first class is common, and usually comprises youths of both sexes from ten to twenty years of age. There are provinces and parts of provinces where most of the household servants are so held ; indeed, it is a common way of holding servants. The second class includes laborers of various kinds, such as farm hands, cattle herders, gatherers of tuba, and watchers of coconut groves ; even sailors are included, and others who, although not properly household servants, may be called on by their creditors for occasional personal service. Such laborers are usually mature men who become indebted.

Generally both classes of debtors are unable to read and write, and cannot perform simple arithmetical calculations ; the second class, however, being older, are able to do the simple calculations required in changing money.

The debts of laborers are incurred either by the laborers themselves or by their parents. The debts of servants are almost always incurred by the parents. There are various ways by which a parent pledges the service of his child for debt. The simplest one is where he borrows money from a rich man on the security of the labor of his child, who serves in the house of the creditor till the principal is paid. Another way is where a parent already in debt has some rich man assume it, and for security gives his child to be held until he

¹ For the relation between the share system and bonded debtors, see page 249.

is able to pay. Sometimes the debt is inherited by the son at the death of his father. Sometimes a man, having taken on credit more goods than he can pay for, gives his child to pay his debt. It is a certain sense of honor, and reverence to their parents impels many to pay off such debts.

The average amount of the debts incurred differs in the different provinces; individual debts vary even more widely. Generally speaking, they range from five to a hundred pesos; the average amount in the Islands is probably from twenty to thirty pesos.

Naturally we should expect the debt to diminish with the length of service, because the servant, as will be shown later, often receives a salary. But in many cases the debt increases in spite of the monthly deductions for salary, either because new loans are made or because the servant is charged for clothing given to him, and usually also for articles lost or broken by him. From some of the accounts kept by the creditor it would seem well-nigh impossible to pay off a debt with service, since the reward for such service is small.¹

¹ Copy of the original account of a servant who began service on February 1, 1911, at 3 pesos a month:

Feb. 1.	Took cash	P 10.00
Feb. 20.	Took cash	2.00
March 15.	Took 1 hat	1.25
April 4.	Took cash	.50
April 20.	Took cash	.50
April 30.	Total	P 14.25
	Salary for 3 months	9.00
	Debt increase	5.25
June 3.	Took cash	P 5.50
June 22.	Took 1 pantalon drill	1.20
Aug. 27.	Took 1 patadion	2.50
Sept. 14.	Took 1 pieza sinemay	2.00
Sept. 30.	Total	P 16.45
	Salary for 5 months	15.00
	Debt increase	1.45
Oct. 8.	Took two cavans palay	5.00
	Took cash	3.00
	Took cash	.50
	Took cash	3.00

The household servants, as a rule, do not get a regular stipend. They are given their food and usually the cast-off clothing of the creditor's family. Occasionally they receive some spending money during a fiesta. Some creditors charge them for clothing; but others, especially the rich, do not. Those who get a regular salary are given very little, from half a peso to three pesos a month. This amount is generally less than that given to nonbonded servants, who get from four to seven pesos a month.

The treatment of household servants differs with different creditors. As a general rule, they are treated as inferiors, but nevertheless their lot is not grievous. They are usually better off with their masters than they would be by themselves, because their physical needs are satisfied, and they do not become public charges. Those who have reported on the subject make the same general observation, that indebted servants abound in those regions where, on account of the density of population, conditions of living are hard and a chronic state of poverty exists. Of course we must recognize that there are individual attitudes toward the servant class. There are some creditors who chastise their servants regularly, and for slight mistakes; there are those who, by means of incorrect accounts, try to keep their servants in debt for longer periods of time than necessary. On the other hand, many creditors treat their servants kindly, although as inferiors; some treat them as members of the household, and give them a chance to improve their conditions. It is even reported that an unusual number of masters help their servants in marriage by giving them either a house or a piece of land to cultivate.

Several causes hold these servants to their lot. In the case of children pledged by their parents the chief cause is, of course, parental authority. This is probably the most potent force that keeps them in practical bondage. A second cause, especially in the case of those whose debts were self-incurred, is the difficulty of getting a living, already alluded to. Again, custom plays an important part, and is reported to be one of

the chief forces that hold bonded servants. Moreover, in many cases the servants believe themselves to be held by legal bond. It is seldom that a written contract is made; in many cases where none exists the servants are nevertheless made to believe that they are held legally. Other forces, such as shame and a certain sense of honor, have been reported, but probably *loyalty* would describe better the feeling which binds many servants to their masters. If we look only at the surface, we are shocked to find the existence of a servant class that is practically in bondage; however, our feeling is modified when we understand the close personal relationship which takes the form of protection on the part of the master, and loyalty on the part of the servant.

Bonded debtors as described here are disappearing in a good many communities; there are fewer of them to-day than during the Spanish administration.¹

The following is a list of some Filipino names for bonded debtor and interest:

DIALECT	BONDED DEBTOR	INTEREST
Tagalog	alila, bataan, alipan, muchacho, propis	patubo, upa sa salapi, pakinsbang, tubo, baba, interes
Pampanga	magipus	tubu
Bicol	bataan, uripen, para utang, prenda, recibo	halaga, tubo, pagpagan-ancia, interes, por ciento
Misamis	prenda, hipoteca	tubo, saca
Visaya	olipen, sologo-on, sulugo, utangan, bina-tonan	dihap, tubo, patubo, saca pasaca

REWARD AND INCENTIVE TO LABOR

The Malayan idea of incentive to work has been debt and fear. The modern idea is greater dignity and reward. It is obvious that bonded debtors have no incentive to labor.

¹ The data on bonded debtors were turned over to Conrado Benitez, Instructor in Economics, University of the Philippines, who, with the help of additional information collected by him, wrote the above discussion.

Their position does not improve with greater effort on their part. Theoretically speaking, the various Philippine agricultural classes can be graded as follows with respect to their reward and its effect on incentive to labor: (1) bonded debtors; (2) wage workers; (3) share workers and share tenants; (4) peasant proprietors. However, other conditions must be taken into consideration, especially the education and character of the laborer, and the attitude of the employer toward him. The share system offers no incentive where exorbitant rates of interest hold the tillers of the soil practically indentured to it. The laborer for daily wage is not efficient if held in the same manner, or if not imbued with sufficient honor to give equivalent labor for his wage. Even the peasant proprietor may be a relatively inferior producer if false pride in his position as landholder and the love of gambling draw him away from the land. In all these points the Filipino agricultural laborers differ, not only individually, but by groups and according to customs and conditions in various regions.

In general, however, the Filipino has lacked incentive to labor because he has not received the rightful share of his production, and has not been protected in his property. Small return, lack of security, and apathy of the government toward industry contributed not a little to foster indolence. Greater effort did not result in greater reward. The laborer could be deprived of his savings in many ways. The possession of much wealth carried certain dangers with it. Hence the Filipino lacked incentive to earn more than the bare necessities, and came to feel that only by immediately consuming them could he enjoy the results of his labor.¹

Unlike the working classes in Europe and the United States, where harder conditions of living exist, the Filipino workers cannot be driven by the scourge of necessity to sustained industrial activity; hence the relation between reward and efficiency is especially important here.

¹ The writings of José Rizal may be consulted on this point, that the indolence of the Filipino results from lack of incentive to labor.

Numerous instances may be cited in which it has been proved that the greater the Filipino's incentive to work, the better laborer he becomes. Small piece contractors on local railroads show twice as much efficiency as day laborers.¹ In the Hawaiian Islands the Filipino contract laborers in cane cutting, and contractors who cultivate a piece of ground and sell the product to plantations, earn more than the day laborers. Furthermore, sugar planters there say that although the Filipinos do not work regularly in the beginning, yet after the first money is spent for fancy clothes and ornaments instead of for the necessities of life, they usually settle down to regular work, earn more than enough to live comfortably, and increase in efficiency.

With better education, with the knowledge that he will be protected in the reward of his labor, with greater and higher wants, the law of increased efficiency with increased reward will apply to the Filipino even more than it does now.

MOBILITY OF LABOR

The demand for labor in agriculture varies with the season ; it is greatest at the seasons of planting and harvesting. The degree to which this demand is supplied depends on the mobility of labor. In the United States, for instance, there is an exodus of workers from the city to the farm and the orchard during the harvest seasons, and a movement of laborers from south to north as the crops mature. In Ceylon there is a seasonal movement to the tea plantations from India.

Such seasonal labor movements occur in the Philippines also. Within given regions they often take place from town to town ; one town plants a kind of rice which matures early, another a kind which is harvested late ; and so the harvest occurs at intervals. In such regions many persons move from town to town to help in the harvest. When the crop is short in any one place, an especially large number of persons participate

¹ Report of the Philippine Commission, 1907, p. 1021.



CHART XXXIII

in the exodus from it to the rice fields of more fortunate regions. These people often belong to the small floating population which goes from barrio to barrio as work demands, but most of the harvesters are permanent residents of some one locality. Hence the ill effects of this system can be seen (1) in the temporary abandonment of home and domestic animals (whole barrios are often deserted), (2) in time lost in traveling, and (3) in loss in education of children taken from school. Yet such an influx of laborers is often necessary for the harvesting of the rice crop; in densely populated districts the added supply of rice so obtained is very important.

There are also several large areas in which the labor supply for the harvest is deficient, and definite regions from which labor is commonly drawn to them. Such regions are shown on Chart XXXIII.

The character of the migration from Panay and Cebu to the sugar fields of Negros has already been discussed in the chapters on sugar and land tenure. The migration involves several thousand men, usually not accompanied by their families. Most of these are rice farmers, who leave after the harvest and return for planting, a period from November to March. Many go back to their homes as poor as they left them, or with only better clothing. Some have saved money for the purchase of land or work animals. This differs from other movements chiefly in that the laborer is under contract and works for a wage.

There is also a migration from parts of Batangas to San Pablo, in Laguna Province, and to Tayabas Province, where the laborers work in the coconut groves.

The other great seasonal labor migrations indicated on the map are in connection with rice harvests. The most important of these is that of Ilocanos to the central Plain of Luzon (the provinces of Pangasinan, Tarlac, and Nueva Ecija). This migration occurs from December to April. Rice matures early in the Ilocano provinces; after the harvest hundreds of families journey south in groups, some walking and camping,

others going by sailboat. They harvest rice for one fifth of the crop. Some convert their share into money, but most of them return by boat with the rice. Many take cloths woven in their homes or in their locality and dispose of them to the people of the Plain. The Ilocanos are the most mobile of all Filipino peoples.

Harvest by outsiders is not always to the economic advantage of the owners of small rice fields, but custom permits anybody to help in the harvest for a share of the crop. The ill effect of the large share given to the harvesters has already been explained (Chapter II).

Lack of mobility of labor in certain regions of the Islands may be accounted for by the antipathy of the people, and by the debt system, which holds them to the locality.¹ The establishment of peace conditions, the construction of railroads, and in general the improvement in means of communication tend to increase the mobility of labor. This is noted in all parts of the Philippines.

PLANTATION LABOR

The discussion of agricultural labor as presented in Chapters XII and XIII is from the point of view of the country as a whole, and with respect to systems of agricultural organizations now extant. Investment of foreign capital in Philippine agricultural enterprises has usually taken the form of plantations on which a supply of efficient labor must be established and maintained. The increasing number of such plantations makes the question of an effective supply of labor extremely important. Early during the American occupation it was recognized that such a supply did not exist here, and the admittance of Chinese coolie labor was agitated. As a result, such labor was excluded by law from the Philippines, chiefly for the following reasons: (1) the natives object

¹ This question is taken up at length under the heading Density of Population in Chapter XVII.

to the Chinese; (2) the Chinese seldom remain primary producers for any length of time; (3) the Chinese become a commercial class, driving native and white merchants out of business. Since the passage of the exclusion law, there has been suggested the possibility of bringing in indentured coolie laborers under contract to leave the country at the end of their term of service. In view of the fact that such systems have been recently repudiated in countries which have used them, such action would be a distinct step backward.¹

Plantation labor here must therefore be Filipino. Much doubt was at first expressed as to whether Philippine agricultural laborers would ever be efficient enough for plantation purposes. In view of experience with them on various plantations now established here, and their success in competing with the laborers of other nationalities on the plantations of the Hawaiian Islands, it appears that the Filipinos make efficient resident plantation laborers if they are paid a just wage, are well housed in villages under attractive surroundings, are provided with amusements, are superintended by overseers who understand them, are assured of the receipt of the total wage earned, and in general are treated with justice. The use of a bonus, share, or piece system is also efficacious.²

The creation of a supply of resident labor on a modern plantation is, of course, imperative. The measure of success which the Filipino laborer has attained in the Hawaiian Islands and the cause of it may be understood from the following extracts:³

Filipino immigration to Hawaii was started in a small way in December, 1906, between which time and December, 1907, approximately

¹ For a discussion of this point, see any United States text on colonial government. "The History of Colonization" (published by the Bureau of Education, Manila), Chapter XVI, may be reviewed.

² The question of the supply of such labor and the regions from which it can be drawn is taken up under the heading Mobility of Labor (page 310) and in the treatment of emigration in Chapter XVII.

³ These extracts were taken from a communication received from the Hawaiian Sugar Planters' Association, Bureau of Labor and Statistics, in

200 Filipinos were brought in. In May, 1909, recruiting operations were again commenced, and from July, 1909, to September 30, 1912, approximately 10,400 arrived. On October 31, 1912, our plantation pay rolls showed that there were 6724 men, 50 women, and 29 minors regularly employed. Of these, 2 men were working as skilled men, 5130 working as day laborers, 1291 working as contractors, and 301 working as profit-sharing planters.

Day laborers receive wages at the rate of \$20 a month of 26 days of 10 hours each, plus overtime, and extra compensation for Sunday work when required. They are also entitled to a bonus on their yearly earnings, if they have averaged 240 days' labor for the year on the same plantation, at a rate based on the New York prices of sugar. During the last year this bonus amounted to 13 per cent, and partial returns from 35 plantations show that 841 Filipinos received \$15,487.02, an average of \$18.42.

Contractors are gangs of men who undertake certain specific plantation operations, such as cultivating fields of cane, cutting, loading, and the like, and are paid so much per ton of cane. Contractors receive a considerably larger amount than ordinary field laborers, ordinarily earning from \$26 to \$35 or \$40 a month.

Profit-sharing planters are those who take over portions of land and raise cane for sale to the plantations. These men also receive considerably higher amounts than day laborers.

In addition to wages all laborers are furnished free of cost with comfortable houses, firewood, water for domestic purposes, and medical and hospital attendance.

Comparatively few of the Filipinos coming to Hawaii have previously been accustomed to continued or systematic work, and their development into satisfactory laborers involves time, patience, and careful supervision. I think, however, that they compare favorably with the initial immigrants of other nationalities.

At first many of them do not work regularly, and we have noticed a tendency after the first pay day to lie off and spend the money earned, much of it going for fancy clothes and adornments, rather than for the necessities of life. After the first money earned is spent, they are more apt to settle down to regular work. After finding that they can earn more than enough to live comfortably, and that they can make some saving, the majority of them increase in efficiency. Recently a good many of them have been returning to the Philippines, paying their own passages, with considerable sums of money saved up.

answer to a schedule of questions. It must be remembered that the report was made on Filipinos in competition with labor from practically all countries from which contract labor can be brought into the Philippines.

At first the Filipinos are not capable of doing the heavier work on the plantation, and so far few of them have taken the heavy loading contracts; in the other kinds of plantation work they are gradually taking their places, even in the mills; those who are doing contract work are, of course, above the average in efficiency.

The motives causing Filipinos to come to Hawaii are difficult to designate, since they probably vary in different cases. My impression is, however, that a desire for a change and a prospect of bettering their positions are probably the chief motives. . . . This office has no accurate knowledge of the number engaged in other gainful occupations. Many of the Filipinos are working for the Federal Government in constructing the dry dock, as stevedores, as yard and house boys, and in the pineapple industry. . . .

Although the beginning of any immigration naturally has its drawbacks and discouragements, and there are many exceptions to the general rule, our Association has, on the whole, found it worth while to encourage the coming of Filipinos. The majority of them have never been accustomed to work, come poorly clothed, ill-fed, and ignorant of our customs and conditions, and it requires a considerable amount of time for the proper building up of their bodies, and training them for the work. When this is done, however, the majority prove fairly steady and efficient workers, and seem willing. The average man is not unruly, and all comply with camp sanitary requirements.¹

The experiences of large Philippine plantations, such as the San José and the Calamba Sugar Estates prove that the Filipino agricultural laborer is efficient when satisfactory conditions of living, working, and remuneration are maintained.

SUGGESTIONS FOR REVIEW AND ORIGINAL WORK

SUGGESTIONS BASED ON THE TEXT

1. The dependence of the economic position of the Philippines on its agricultural labor.
2. The village system of the Philippines. Why it developed.
3. Philippine regions in which scattered farms are the rule. How these developed.
4. Will the village system persist? Give reasons.
5. Points in favor of and against the village system.
6. Labor in common. Examples from the Philippines and other countries.
7. Is it being less used in the Philippines? Why?

¹ In 1918 more than 2700 Filipino laborers went to Hawaii, most of them from Cebu, the Ilocos provinces, and Oriental Negros. Fewer than 1000 laborers returned from Hawaii that year.

8. Explain the relation between group labor and the modern mutual-insurance company. 9. Explain the difference between health, accident, life, fire, marine, and fidelity insurance. 10. Mutual-benefit and benevolent societies in the Philippines.

11. Three points with respect to efficiency of labor. 12. Should the efficiency of the Filipino increase? Why?

13. Plans for improvement in the standard of living of the Filipinos. 14. Public libraries, the reading habit, and gambling.

15. The relation between reward for labor and efficiency of labor, as noted among different kinds of agricultural laborers in the Philippines.

16. In 1918 retail prices on the principal articles of consumption, such as rice, flour, and cotton cloth, were about one hundred per cent higher than in 1913. Wages increased about fifty per cent. Were laborers' wages really increased or not? Explain. 17. Explain how the real wages of an abaca stripper depends on the price for different grades, and on the time and effort required to produce a kilo of each.

18. Change in the ideas with respect to dignity of labor that has been effected in the Philippines during the past twenty years.

19. By Act 2782 the Philippine Legislature has provided funds which will assure every Filipino an intermediate education. What, in your opinion, will the effect of this step be on (a) advance in agriculture, (b) the system of scattered holdings, (c) the size of cultivated holdings, (d) the condition of the *aparceros*, or tenant on shares, (e) the increase in the number of peasant proprietors, (f) on homesteads, (g) the efficiency of labor, (h) the reward of labor, (i) the dignity of labor?

20. Agricultural industries of the Philippines that require seasonal labor. 21. Regions from which it is drawn.

22. You are about to establish a sugar plantation in Occidental Negros. Should you prefer to rely on seasonal labor or on permanent laborers? 23. What steps will you take to keep your laborers permanently on the plantation?

24. Explain the difference between "production per man" and "production per hectare," and illustrate your data by references to various countries in the world. (See Miller and Polley's "Intermediate Geography.")

25. The following is an extract from a paper published in 1919:

In the Philippines the mortality rate among persons more than five years of age is the same as in the United States, but under that age there are three deaths for one in America. This terrible condition is being considered by the Council of State with a view to reducing the infant mortality.

What suggestions on this could you offer to the Council of State?

26. Show that the standard of living in the Philippines has increased with respect to (a) the amount of food eaten, (b) the quality and diversity of food consumed.

27. In August, 1919, certain men of Manila presented a petition to the mayor, requesting that a law be passed abolishing "panguingue" in the city, stating that women neglect their homes, their babies, and their hungry husbands, and that most of the earnings of the tired and hungry husbands are lost. Comment.

28. From the following table of health statistics for the Philippines determine the average annual increase of population in the Philippines for the ten years before 1918:

HEALTH STATISTICS OF THE PHILIPPINE ISLANDS FROM 1904 TO 1917

[Source: Philippine Health Service]

YEAR	PHILIPPINE HEALTH SERVICE'S ESTIMATE OF POPULATION	BIRTHS		DEATHS		NUMBER OF DEATHS PER 100 OF BIRTHS
		Number	Per 1000	Number	Per 1000	
1904. .	7,765,228	216,176	27.839	146,921	18.920	67.964
1905. .	7,897,237	244,586	30.971	166,555	21.090	68.097
1906. .	8,031,490	215,296	26.806	143,284	17.840	66.552
1907. .	8,168,025	258,010	31.588	138,464	16.952	53.666
1908. .	8,306,881	278,369	33.511	190,495	22.932	68.433
1909. .	8,448,098	243,726	28.850	179,355	21.230	73.589
1910. .	8,591,716	290,210	33.778	191,576	22.298	66.013
1911. .	8,737,775	302,855	34.660	188,412	21.563	62.212
1912. .	8,886,317	290,995	32.746	185,185	20.839	63.639
1913. .	9,037,385	316,056	34.972	154,086	17.050	48.753
1914. .	9,191,020	347,337	37.791	163,943	17.837	47.200
1915. .	9,347,267	327,206	35.006	176,313	18.863	53.884
1916. .	9,506,170	336,328	35.380	190,430	20.032	56.620
1917. .	9,667,774	350,002	36.203	209,444	21.664	59.841

29. The Manila Merchants' Association has furnished figures on fourteen of the principal articles of necessity, showing the percentage of increase between the years 1913 and 1919. Four articles of food (flour, rice, salmon, and condensed milk) show an average increase of 214 per cent, whereas in the case of clothing and cotton goods the average increase on nine articles is 177 per cent, etc. The following is a copy of the table indicating the increases :

FOOD	1913	1919	PERCENTAGE OF INCREASE
Flour, per bag	P3.00	P7.00	133
Rice, per cavan	5.00	17.50	250
Salmon, per case	6.50	23.50	261
Condensed milk, per case	8.00	25.00	212

(Average increase on the four articles of food, 214 per cent.)

CLOTHING, ETC.	1913	1919	PERCENTAGE OF INCREASE
Gray shirtings, per piece	P8.00	P20.00	150
White shirtings, per piece	6.50	18.00	177
Turkey red cloth, per piece	2.50	6.00	140
White cotton drills, per piece	8.50	22.50	165
Nainsooks (white), per piece	2.80	8.00	186
White ground prints, per yard	.08½	.27	217
Colored ground prints, per yard	.10	.32	220
Cotton colored trouserings, per piece	.16	.47	194
Boots and shoes, one kind with the other			145

(Average increase on the nine articles of clothing, etc., 177 per cent.)

Petroleum, per case	P4.00	P8.85	121
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(Average, 183 per cent.)

Cotton yarn has increased 300 per cent.

Hardware, paints, oils, etc. have increased more than 200 per cent.

Rent for furnished room

Rent for unfurnished house

Servants' wages

} Increased more than 100 per cent.

The figures given on page 319 indicate an increase of a hundred per cent in servants' wages during the period under discussion. Was this increase sufficient?

30. The government bonuses of 1919 were as follows:

On less than ₱2400 per annum, 25 per cent;

On from ₱2400 up to but not including ₱4000 per annum, 15 per cent;

On from ₱4000 per annum, 10 per cent.

31. What was the economic basis for not granting a flat bonus of, say, 20 per cent to everybody? 32. Were the bonuses granted adequate in view of the figures from the Manila Merchants' Association? 33. In general, what class of society was better off in 1919, (a) day laborers and persons on salaries, (b) farmers owning their own lands, (c) farmers on shares, (d) merchants, or (e) manufacturers? 34. Why in general is an increase in prices beneficial to producers, and harmful to persons with fixed incomes, such as laborers and persons working on the basis of a salary? 35. Why is just the opposite true when prices fall?

36. Secure data from the census of 1918 and bring in a report as to occupations in the Philippines, indicating the importance of various primary and secondary occupations.

37. Secure data from the census of 1918 and bring in a report on classes of buildings according to the materials in various provinces.

SUGGESTIONS FOR THE STUDY OF LOCAL CONDITIONS

1. Secondary employments. 2. Village and scattered-holding systems. 3. Forms of group labor. 4. Persistence of group labor. 5. Improvement in standard of living. 6. Examples of reward for labor affecting its efficiency. 7. Seasonal labor.

SUGGESTIONS FOR REPORTS FROM REFERENCES

1. Government insurance funds: land title, property and fidelity bond. (Annual report of the Treasurer of the Philippine Islands.)

2. From Act 2581, and the latest annual report of the Insular Treasurer, determine the activities of insurance companies in the

Philippine Islands, and point out the control exercised over them by the government.

3. A study of the business transacted by life-insurance companies and fire-insurance companies in the Philippine Islands as reported in the last Annual Report of the Insular Collector of Customs.

4. Secure the necessary data from the latest annual report of the Collector of Customs and bring Chart XXXII down to the present. 5. Comment on these new figures.

6. Food industries. (All commercial geographies.)

SELECTIONS ON THE THEORY OF ECONOMICS TO BE APPLIED TO THE MATERIAL IN THE CHAPTER

1. Standard of living. (Bullock, pages 21-28.)

2. Factors of production. (Bullock, pages 35-45.)

3. National insurance and its distribution. (Bullock, pages 255-260.)

4. Interest. (Bullock, pages 261-270.)

5. Wages. (Bullock, pages 271-279.)

6. Rent. (Bullock, pages 279-291.)

7. Profits. (Bullock, pages 293-296.)

8. The relation of laborers to the product of their labor. (Bullock, pages 318-323.)

9. The labor contract. (Bullock, pages 297-300.)

10. Labor legislation. (Bullock, pages 300-304.)

PART III. INDUSTRIES OTHER THAN AGRICULTURE

CHAPTER XIV

THE ANIMAL INDUSTRY

DOMESTIC ANIMALS

The Philippines are naturally an excellent grazing country. The grasslands of the Islands comprise approximately forty per cent of the total area.¹ In many parts there are extensive ranges of good pasture grasses, as well as large areas of cogon grass, which afford good pasturage if kept closely cropped.² The carabao is indigenous to the Philippines. Cattle, horses, and goats were introduced by the Spaniards from Europe, Mexico, and China. These rapidly increased in number, and by 1609 were raised on stock farms in different parts of the Islands.³

Before 1888 the amount of live stock in the Philippines was greater than the needs of the people required. In the grazing regions there were many thousand head of carabao, cattle, and horses; and plenty of animals were available for agriculture. Since that date, however, rinderpest, surra, and the ravages of war have reduced the number to only a fraction of what previously existed.

¹ See Chart XXVIII.

² For a discussion of Philippine grazing area, see Miller's "Commercial Geography."

³ Blair and Robertson's "The Philippine Islands," XI, 89.

In the consideration of the various domestic animals of the Philippines the carabao must be placed first, as being the most important.¹ Probably ninety per cent of the agricultural and transportation work is done by carabaos. They are used in preparing the land for planting, in cultivating it, and in transporting the crop to market. Their milk is used exclusively by the Filipinos. Whether carabaos are better work animals than oxen is a debatable question. There can be no doubt, however, that the Filipino farmers and laborers prefer the carabao, and it is given better treatment and more attention than any other domestic animal in the Islands. The particular advantage which the carabao has over other draft animals is its ability to work easily in mud, where oxen are of little value and the horse is useless. This consideration is a most important one on account of the semiliquid state to which the lowland rice fields must be reduced before planting. For work in these fields the carabao is the only animal in existence that is satisfactory. Though carabaos can draw heavier loads than cattle, they are really inferior as draft animals, since they are unable to work so continuously or to perform labor in the sun so well. Moreover, they do not increase so rapidly, and are somewhat more susceptible to disease.

The cattle found in the Islands came originally from China and Spain. There were formerly large numbers of them, but diseases have now so reduced them that only a few small herds are left. The larger of the native cattle make good work animals, and many of them are used for that purpose. Most domestic cattle, and particularly those of the larger herds, are small in stature and are killed for beef. Their small size is not due to the lack of feed, but to deterioration, since no fresh blood has been introduced into the herds for a number of years. Besides these native cattle several thousands have annually been imported from China, Indo-China, and certain other countries. Most of these were intended for

¹ This discussion of Philippine domestic animals is taken largely from the *Agricultural Review*, Vol. IV, No. 9.

meat, but a large number were sent into the provinces and used for agriculture or transportation. To improve the local stock, the Bureau of Agriculture has from time to time imported various breeds. Some of the crosses produced have proved satisfactory. Among these the Nellore cattle of India are worthy of special mention, since they are seldom attacked by the tick and resist rinderpest, the two chief cattle pests in the Philippines. Little fresh milk is used in the Philippines, and only a few milch cows have been imported, from Australia.

The horse of the Philippines is a descendant of the Sulu horse and the horses brought by the Spaniards from Mexico and China. Although it is a small animal, probably no other breed of horses in the world has the combined qualities of style, action, vigor, and endurance to the same degree that the Philippine breed has. This has doubtless come about from the little attention given to these animals; and thus, by a process of natural selection, those have survived which are best fitted to endure the conditions of Philippine life. The Philippine horse is used for riding and light hauling. No heavy work in the field or on the road is performed by it; cattle and carabaos are used instead. In mountainous regions horses are often utilized as pack animals.

To a person familiar with the horses of Europe or America the uniformity in the types of Philippine horse and its limitation to light draft work seem peculiar. The types of European and American horses are many and varied, from selection and breeding. Some are strong, massive draft animals, used to pull great loads through the streets. Others are bred for work on farms. Then there are horses for driving in carriages, and others for riding. Within each of these types there are subtypes. The horses from certain localities in the Philippines, such as Abra, Batangas, and Cebu, have a reputation for strength and speed, but no breed has been developed here other than the general type. During the last fifteen years the demand for horses in the larger towns has depleted the farms

of their best animals. The poorer animals have been left to reproduce their kind; as a consequence, the Philippine horse has deteriorated.

Before surra became prevalent in the Islands, the supply of horses in all districts was plentiful. This disease, however, left many towns with scarcely an animal, and everywhere the price given for a good horse has increased several fold. Chiefly for this reason a large number of horses have been imported from Australia.

It is important that the native horses be improved. This can be accomplished through selection, better care, and crossing with high-grade animals imported from other countries. Horses, since they have greater speed than either carabaos or cattle, would be more suitable for transportation; except in rice paddies they would be better for plowing and tilling the land. Indeed, in Cuenca, in Batangas, much of the plowing is done by horses; in certain localities the small native horse is now used for both plowing and tilling. On the wharfs at Cebu wagons are seen hauled by native horses. In the Islands as a whole, however, the horse will not supplant other work animals for heavy transportation and for agricultural work until the breed has been improved.

Swine are a source of great wealth in the United States, where large and important industries in agriculture, commerce, and manufacture are dependent on them. It is doubtful if these industries could have attained their present state of development if it had not been for the care taken in improving the breeds of swine, to produce the greatest amount of meat and fat from the food given. Swine are bred commercially on the farms; they are fattened for market on food of which the value and economy have been determined by experience or by scientific experiment.

In comparison with the attention given to raising swine in the United States the situation in the Philippines is peculiar. Here the swine are really scavengers, for they are seldom penned, and are compelled to find most of their food. The

number of swine raised in the Islands is not great, but most families have a breeding female, the young from which are raised and eaten. Usually, however, they are confined to a pen for a few weeks to be fattened by special feeding before they are killed.

Philippine swine are long-nosed, narrow-bodied, and flat-sided. Their shape is not conducive to a large yield of fat and flesh, even if they do respond fairly well to feeding. The greater part of the population of the Philippines is dependent on swine for its meat supply. Pork is found in nearly all markets, whereas beef is often lacking. There is always a good local demand for pork in all parts of the Islands, and a constant shipment to the larger towns. There is also a large importation of pork products. Hence the Philippines offer an exceptional opportunity for the raising of swine on a commercial basis.

Good food for fattening swine is produced in the Philippines. At the present time chopped banana stalks and tiquitiqui are the most used, but these are of low nutritive value. Corn, which is probably the best of all food for swine, is raised here. By changing corn into pork the farmers in the United States make millions of pesos annually. Other Philippine food for swine consists of peanuts, sorghums, and the various kinds of beans. Rice bran is abundant and nutritious. The milk of the coconut contains a considerable amount of nutriment; instead of being wasted, as it now is, it might well be saved and given to the swine, just as in the United States skimmed milk, a by-product of the dairy industry, is fed to them. Coconut milk, however, should be used in connection with other food. Copra cake from the oil presses is also excellent food.

However, that the Philippine swine may be profitable, it is necessary to improve the breed. Swine of good breed have been introduced into certain localities, as in Lipa, in Batangas, where to-day can be found specimens which compare favorably with the American hog.

A small number of goats wander about nearly every barrio in the Philippines. No particular care is given to them; they are seldom used except to furnish flesh for feasts, or, in a limited way, to transport small loads. The goat could be made of considerable importance in the Philippines if the value of its milk were understood. Goats' milk is superior to that of the cow or of the carabao, and is produced much more economically. In many countries, both temperate and tropical, it is consumed in large quantities. Some of the best breeds of milch goats, such as the Maltese, have already been introduced into the Philippines; the increase of these would probably go a long way toward reducing the high rate of infant mortality in the Islands.

There are no chicken farms in the Philippines, but each family usually has a few chickens for its own use. Poultry, next to pork, is the chief meat eaten, but in the Islands as a whole there is an undersupply of poultry and eggs; this is due not only to the small number of chickens and ducks raised, but also to their poor laying qualities. Such a condition is largely the result of cockfighting. The high valuation placed on the game bird, rather than on either hens or eggs, has resulted in a small type of chicken for food, which lays only a few small eggs and has tough and poorly flavored meat. The eggs annually imported from China amount to more than 4,000,000 dozen yearly, valued at from ₱600,000 to ₱700,000, but these do not entirely supply the demand of the larger cities. In many of the smaller communities eggs are seldom available. Increase in the amount of domestic poultry and of eggs may be brought about either by increasing the number of domestic chickens used for food, or by raising poultry on farms, as is done in the United States and in certain countries of Europe. In any case, however, good results will be secured only by improving the breed of poultry. At the present time farmers often add to their income by the manufacture and sale of articles made in their homes. The sale of chickens, ducks, and eggs can also be made to yield additional income.

Poultry raising as a business has received some attention in and about Manila, but as yet little has been accomplished. In raising poultry here cleanliness must be the great care.

ANIMAL BREEDING

In most civilized countries of the world man's control over flora and fauna is such that he determines their types. Improvement by selection in the vegetable kingdom has already been explained. The effects of selection are often better shown in the animal kingdom. For instance, the horse may be bred either for massiveness and strength or for speed; some cattle are bred for meat, others for milk.¹ Some breeds of chickens are noted for their laying, others for the quality of their flesh, and still others for their ability as fighters. In animals selection is little practiced by the Filipinos, and for this reason the animals raised on the Islands for any great length of time have deteriorated. By careful selection and the introduction of new breeds from foreign countries great improvement can be made in all domestic animals.

FORAGE

Another problem connected with the animals in the Philippines is that of forage.² In the temperate zone the grass is killed by frost or snow; hence it is necessary to provide forage for the winter months. In the tropics the growth of wild grasses and other forage plants is continuous throughout the year, except in regions subject to a dry season, in which regions some system of irrigation is usually found.

The chief forage crop now cultivated in the Philippines is barit (*Leersia hezandra*), which is fed green. A large amount of food is also obtained from the by-products of the crops grown for man, the most important of which are rice straw,

¹ Gregory, Keller, and Bishop's "Physical and Commercial Geography."

² This discussion of forage is based upon data from the *Agricultural Review*, Vol. IV, No. 8.

corn leaves, sugar-cane leaves, and peanut vines. Cattle and carabaos thrive on the native pastures and the grasses grown for forage, but the Filipino horses are insufficiently fed on their ration of green grass with an occasional small portion of unhulled rice. At present a sufficient amount of home-grown food cannot be obtained for the several thousand horses imported from America and Australia. Since about three million pesos' worth of food is normally imported every year, it is important to find forage crops that can be grown and cured locally as substitutes for this, so far as food value and cheapness are concerned. Experiments on local and imported grasses have been made to determine (1) which will yield palatable hay; (2) what the possibilities are of curing hay, so that it will keep in storage; and (3) what the profitableness of the crop is, as compared with other field crops. None of the local grasses give promise as hay crops. On account of the humidity of the atmosphere, even during the dry season, only the slender-stemmed imported grasses can be easily and satisfactorily cured. The best of these have been found to be Rhodes grass (*Chloris gayana*) and Tunis and Sudan grasses (*Andropogon halepensis*). The production of corn-blade fodder seems practicable. Curing hay from all these plants during the dry season presents no great difficulty. From the point of view of market facilities the best localities for commercial hay growing at present are in Luzon.

RINDERPEST

The greatest problem connected with agriculture in the Philippines is that of overcoming rinderpest, or of holding it in check.¹ The history of rinderpest extends over a long period of years. This disease has existed on the continent

¹ This discussion on rinderpest is largely based on an article in the *Agricultural Review*, July, 1911, written by Dr. A. R. Ward, Chief Veterinarian of the Philippine Bureau of Agriculture. It sets forth the present policy of that bureau with respect to rinderpest.



Photo by Bureau of Agriculture

CURING AN INTRODUCED GRASS FOR HAY



GATHERING ZACATE, OR GREEN FEED

FORAGE

of Asia since the earliest authentic records, whither it was carried by great migrations and by war and commerce. There are definite accounts of its appearance in Europe from time to time during the past fourteen hundred years. In the eighteenth century 200,000,000 head of cattle were destroyed by it in Europe. In its last invasion of England, in 1865-1866, some 279,000 head of cattle were attacked in eighteen months.

Long experience has demonstrated that rinderpest can be exterminated by the slaughter of the diseased and suspected animals, together with thorough disinfection, or by preventing the intermingling of the infected animals with the well. By these methods the disease has been overcome in Europe. In the past sixteen years an earnest effort has been made to control the disease with antitoxic serum, but a critical study of the results of its use has led to the abandonment of this method.

In the discussion of the importation of rice it was noted that rinderpest was introduced into the Philippines about the year 1888. It rapidly spread to many of the provinces, and thousands of cattle and carabaos died. On the ranges of the Cagayan Valley ninety-five per cent of the cattle perished; everywhere in the Islands the losses were tremendous. In 1892 practically all the cattle on Masbate Island succumbed. By the year 1894 the disease had largely spent itself, but only a small percentage of the animals were left. These were apparently sufficient for the needs of the Islands, however, since few cattle were imported. With the World War came the destruction of live stock and a reoccurrence of rinderpest. This outbreak was probably due to infected cattle brought in during some of the numerous shipments from China, where the pest existed. Again there were large losses, from which the Islands have never recovered. This attack spent itself, but sporadic outbreaks have occurred almost every year. Many of these outbreaks are undoubtedly caused by infection from imported animals, and others by local infection.

The effect of rinderpest on economic conditions in the Philippines has been great. In agriculture it has caused the abandonment, permanently or temporarily, of thousands of hectares of land, and a consequent increase in rice imports; with carabaos selling at exorbitant prices hundreds of people in certain regions were driven from farming in the lowlands, and resorted to the kaingin or some other means of earning a living. It has also encouraged the growing of such export crops as abaca and copra, which do not require much labor and cultivation. It has increased the difficulty of carrying agricultural products to market. The additional cost of logging operations has checked the building of good houses because of the lack of cheap lumber. Finally, it has so reduced the domestic supply of beef that the diet of the Filipinos now contains little meat.

The problem of increasing the number of animals in the Philippines sufficiently to meet insular needs is difficult, and has given rise to disagreements on the part of experts and other interested persons. Obviously the quickest and easiest method is to import animals from other countries, such as China, Indo-China, India, and Australia, all of which have a surplus. However, from the standpoint of the agricultural and industrial welfare of the Philippines, it is necessary that the imported animals be free from disease. Cattle from the countries just mentioned are subject to attacks of either rinderpest or pleuropneumonia, and their admission, even after careful quarantine, has been found dangerous, several outbreaks of rinderpest having been directly traced to them. Outbreaks of rinderpest have at times been caused by the introduction of animals which were killed for meat almost immediately.

The safest procedure would be to place an embargo on the importation of carabaos and cattle, and at the same time to undertake a systematic quarantine of the Islands and by the immunization of work animals stamp out the disease. The high prices which work bullocks bring in the Philippines

warrant the expense of immunizing them for export from Asia. It has now been fairly well proved that the bullocks of southwestern Asia can be successfully immunized against rinderpest. Immunized animals from that region may therefore be safely imported for purposes of agriculture and transportation.

The foreign population has always preferred cold-storage meat imported from Australia; such meat could be brought into the Islands for consumption by the Filipinos.

This plan is not practicable, however. In the first place, the Filipinos boil their meat, and cold-storage meat is not so good as fresh beef when cooked in this way. The Filipinos prefer fresh meat. Moreover, the natural increase in animals is not sufficient, even when supplemented by importations of immunized animals from Asia; agriculture is progressing too rapidly.

The plan of embargo was begun, but has now been abandoned. Carabaos and cattle are now imported into the Philippines under strict quarantine. Occasionally an outbreak has occurred of rinderpest and other epidemic diseases, but these have so far been held in control. Certain chances must be taken to meet in some degree the pressing needs of the Islands for work animals and animals for slaughter. In the past few years an average number of about 1500 carabaos and 10,000 cattle have been imported annually, chiefly from the French East Indies. The cattle are valued at about ₱500,000. They are mostly slaughtered. In addition, the normal import of fresh beef into the Islands is valued at more than ₱1,000,000. It comes from Australia when shipping is available.

Coincident with this importation of animals there is being carried on a campaign to control rinderpest in the Islands. The methods employed by the Bureau of Agriculture consist in confining the sick and in keeping the susceptible animals isolated from one another. In other words, it is hoped to control the disease by quarantine. Pursuantly to this policy districts in which epidemics occur are specially quarantined. This would be a much easier task were the agricultural and

grazing lands of the Islands divided into parcels by fences, as in most countries of Europe and America. In the Philippines the lands are unfenced, and consequently animals graze together. In many of the Islands, especially in Luzon, there is also an extensive movement of cattle from province to province, which increases the liability of spreading the disease. However, by local quarantine it is hoped to hold outbreaks in check.

Under the most favorable conditions the extinction of rinderpest will involve many years of work, with occasional periods of seeming failure; there will be annoyance and loss to agriculturists, who during the quarantine cannot use their animals at all, or only to a limited extent.

If, by keeping out foreign cattle not immunized, and by imposing local quarantine to protect native carabaos and cattle, rinderpest is finally controlled in the Philippines; and if a sufficient number of cattle for agriculture, transportation, and food are raised, one of the greatest economic problems of the Islands will have been solved. Stock raising may become a most important industry in numerous grazing regions. Meanwhile it is not probable that much capital will be invested in large stock-raising enterprises. The breeding of domestic cattle will probably be limited for some time to isolated regions and to small islands.

Can a general campaign of immunizing carabaos and cattle be carried to a successful conclusion, just as vaccination has held smallpox in control? Probably not at this time. Such a campaign would require the coöperation of the entire community and of every region of the Philippines; this cannot be expected until the people are educated to a general understanding of its importance. Moreover, it will require a large government appropriation and effort. With its present appropriation and force the Bureau of Agriculture is able to immunize annually no more than 10,000 or 12,000 animals, which are fewer than the normal annual increase in the Islands usually is.

That there has been a considerable increase in the number of domestic animals is indicated by the table on page 336.

ECONOMIC CONDITIONS

YEAR	POPULATION	CARABAOS		CATTLE		HORSES		HOGS		GOATS		SHEEP	
		Number	Percentage of population	Number	Percentage of population	Number	Percentage of population	Number	Percentage of population	Number	Percentage of population	Number	Percentage of population
1903	6,987,686	640,871	9.17	127,559	1.82	144,171	2.06	1,179,371	16.88	124,334	1.78	30,428	0.43
1910	8,713,668	756,724	8.68	269,963	3.10	142,604	1.64	1,681,550	19.30	441,455	5.07	94,166	1.08
1911	8,866,157	863,649	9.74	315,495	3.56	151,696	1.71	1,703,078	19.21	455,291	5.13	93,341	1.05
1912	9,021,315	958,512	10.62	362,230	4.01	170,861	1.89	1,888,122	20.93	475,794	5.27	98,656	1.09
1913	9,179,188	1,047,164	11.41	418,114	4.55	179,089	1.95	2,016,736	21.97	528,180	5.75	104,147	1.13
1914	9,339,824	1,147,433	12.29	477,736	5.11	215,826	2.31	2,285,880	24.47	592,042	6.34	118,010	1.26
1915	9,503,271	1,221,866	12.86	534,106	5.62	223,195	2.35	2,521,143	26.53	644,026	6.78	129,470	1.36
1916	9,669,500	1,228,836	12.71	566,199	5.85	203,430	2.10	2,734,684	28.28	604,332	6.25	130,034	1.34
1917	9,838,700	1,271,315	12.61	535,000	5.44	214,204	2.20	2,810,000	29.00	723,532	7.00	155,000	1.50
1918	10,000,000	1,337,616	13.37	603,107	6.03	234,021	2.34	2,992,164	29.90	741,000	7.41	165,000	1.65

SUGGESTIONS FOR REVIEW AND ORIGINAL WORK

SUGGESTIONS BASED ON THE TEXT

1. What has been the percentage of increase in the domestic animals in the Philippines since 1903? 2. Account for these increases.

3. Why can the government not shut out all cattle from the Philippines (thus preventing the importation of rinderpest and other epidemic diseases of cattle), and rely on the natural increase of work animals to care for the needs of the country? 4. What is the policy of the government?

5. The chief difficulties in the control of rinderpest in the Philippines are unfenced fields and the lack of coöperation of the people, who insist on evading quarantine and using their animals. Explain why these difficulties occur, and how they may be minimized or overcome. 6. Would fencing the agricultural lands pay?

7. You have been designated by the directors of a corporation to select a locality for starting a cattle ranch. Bring in your report.

8. Explain how the increased use of gasoline tractors and motor trucks will indirectly help the natural increase of work animals to meet the needs of agriculture.

9. How would the control of rinderpest in the Philippines increase the standard of living here?

SUGGESTIONS FOR THE STUDY OF LOCAL CONDITIONS

1. Chickens, ducks, and eggs. Could the production be increased? Is the demand met? 2. Consumption of meat (beef and pork). Is enough available? 3. Rinderpest and its control. Is the supply of draft animals adequate?

SUGGESTIONS FOR REPORTS FROM REFERENCES, ESPECIALLY FROM COMMERCIAL GEOGRAPHIES

1. Compare the number of domestic animals in percentages of the population in the Philippines with those of the United States and other countries.

2. The world's draft animals. (All commercial geographies.)

3. The gasoline engine and draft animals.

4. Make and explain charts showing the uses of beef cattle; of pigs.

5. The world's cattle industry (Brigham, pages 40-49; Bishop and Keller; Finch and Baker). Sources for the supply of work animals and meat for the Philippines.

6. The cold-storage industry. (In and about Manila a report on the methods used in local cold storage may be written.)

7. The pork-packing industry of the United States. 8. The world's swine industry. 9. The world's sheep industry. (All commercial geographies.)

10. Goats. (Finch and Baker.)

11. By-products of the animal industries (leather, furs, fertilizers). (Bishop and Keller, and other commercial geographies.)

12. Tanning materials: those used in the Philippines; production and uses of leather in the Philippines. (Miller.) 13. The value of the goat in Italy.

14. The poultry industry in the United States. (All commercial geographies; Finch and Baker.) 15. Why the Philippines do not produce enough eggs for local consumption. 16. Can poultry be raised commercially in the Philippines?

17. Hay and forage. (Miller; Finch and Baker.)

18. With data from the census of 1918 prepare maps showing the distribution of the following animals in the Philippines: carabaos, cattle, horses, swine, chickens.

CHAPTER XV

FISHING

INSHORE FISHERIES

The countless lights seen at night along the coasts of well-populated islands, such as Cebu and most islands of the Archipelago, are indicative of the extent of inshore fisheries in the Philippines. Most of the fish caught in the Philippines come from these inshore fisheries; although no large enterprises are involved, their aggregate is very large. Nearly all the Islands have shallow waters along the coasts, and the fishing banks are prolific and widely scattered. Those of which the commercial value is best known are at Sitanki, Masbate, Cebu, Corregidor Island, Cuyo Islands, Zamboanga, and San Miguel Bay.

Although other methods of fishing are employed, the use of the dragnet is distinctly the most efficient and popular. The boats ordinarily used for this kind of fishing are fairly large, carrying from thirty to forty men. Work is usually done at night, when lights can be used to attract the fish. For catching small fish along the beaches and in shallow waters purse nets and hand traps are used by men, women, and children. Shrimps, clams, oysters, crabs, and other shellfish are also gathered. Fish corrals, or traps, made of bamboo have been used in the Islands from historic times. The natives were using them when the Spaniards came to the Islands; a large part of the fish consumed here are still caught by this method. Commercially speaking, this is the most profitable of all methods employed.

As a rule, the Filipinos who live along the coast divide their time between the farm and the sea. Few of them make

a business of fishing. Outside of the large towns it is usual for each family to secure its own supply of fish, or to purchase it from those who have been more diligent or fortunate. On unusually successful days the catch of fish may exceed local demands, and the surplus is carried to other towns. Near the large towns, especially where prolific banks exist, there are barrios that live almost entirely by fishing. For instance, at least four fifths of the people in the Malabon district of Rizal



BOATS USED FOR INSHORE FISHING

Province derive their living directly or indirectly from the sea. Even about Manila Bay, and on the rivers and estuaries emptying into it, may be found towns largely dependent on fishing. Their product is sold in Manila and other large places. In general, however, a fishing barrio is the poorest part of a town. The people barely make a living, and in many cases have to supplement their earnings by means of a few coconut trees or other small plantings of grain or tubers about their houses.

In certain localities in the Philippines, such as the mouths of the Cagayan River in northern Luzon, and the Agusan

River in Mindanao, schools of fish appear at certain seasons of the year, and the catch is often large. During these runs the inhabitants of the neighboring provinces come in their boats. It is estimated that twenty-five hundred persons from Ilocos Norte alone come each year to the fishing grounds near Aparri. They dry the fish, or make them into bagoong for shipment inland.

The fishermen are not necessarily the owners of the boats, nets, and traps with which they carry on the inshore fishing. The work is often done on shares, the size of the shares varying with the method of fishing. In Batangas from eight to twelve men operate a boat under the direction of a headman, who sells the fish and divides the money. The owner of the boat and nets receives one half; the other half is divided among the men, the headman receiving twice the share of any other. When the boats and nets are owned by different persons, the owner of the nets receives one fourteenth, and the owner of the boats six fourteenths. In some other places the workers are paid in fish at the rate of about half a peso a day. In general, however, it may be stated that where boats and nets are used, the catch is divided equally between the owner of the equipment and the fishermen. Under this arrangement the fishermen repair the nets or make new sections during the off season.

Five men are usually required to run a trap and keep it in repair; it is not often that an owner personally takes care of it. The catch is divided into two parts, half for the owner and half for the laborers. A division more advantageous to the owner is that in which he receives all the fish until he is reimbursed for the expenses of making the trap, after which he receives one half of the catch, and divides the other half among the laborers. In a few instances the men are hired outright to tend the trap.

It is not often that the fishermen themselves vend their catch. Usually fish merchants (men or women) purchase the fish, to sell it again in the market or peddle it about the town.

FRESH-WATER FISHERIES

In several of the larger fresh-water lakes of the Philippines a considerable amount of fish is caught. For instance, it is estimated that the fish taken during one year along the north-eastern shores of Laguna de Bay is worth about ₱40,000. The methods by which these fish are caught and the division of the product are similar to those of inshore fishing.

The rivers contain several varieties of fish. The mud fish is found in abundance, the number caught in the rice fields sometimes being so large that at plowing time the fishing privileges are sold. Besides the mud fish, frogs are obtained, as well as fresh-water clams and other shellfish. Much river fishing is done during the rainy season or when people are not engaged in planting rice. Boats, nets, and traps are used in the rivers; in the shallow fields hand traps are much employed. Some fishing is also done with hook and line.

These fresh-water fish, together with fresh or preserved fish imported from the coast, constitute a large part of the proteid food consumed in the inland regions of the Philippines.

FISH CULTURE

In the provinces about Manila, and to a certain extent near Iloilo, milk fish are grown in ponds. These fish form an important part of the commercial supply for the two cities and for the country roundabout. The ponds are expensive; for it requires a considerable amount of capital to build them and to carry on the industry.

PRESERVED FISH

A large part of the fish eaten in the Philippines are consumed fresh, chiefly because the majority of the people obtain their own supply. However, if there is a surplus, it is often dried, and thus preserved for a few days. Fish caught in commercial quantities are made into bagoong, or sometimes smoked.



INLAND FISHERIES: CATCHING MUDFISH WITH HAND TRAPS
IN THE RICE FIELDS



DRYING FISH

The food value of bagoong has already been discussed in its relation to the standard of living. Preserved fish are of course more generally consumed in the interior than along the coasts.

INCREASING THE SUPPLY. DEEP-SEA FISHING

The market for fish in the Philippines is greatly under-supplied. There are few towns in the Islands which at the present time could not consume more fish than are available. In many places the poor buy canned salmon, because it is cheaper than local fish. This condition arises from the inadequate methods of catching fish and the limitations of inshore fishing; the largest and most prolific banks are almost untouched. The fish imported into the Philippines are valued at more than ₱1,000,000 annually; they consist, for the most part, of cheap canned salmon and sardines.

In other countries in which fishing is an important industry the fishing grounds are often a long distance from home. Large sailing or steam vessels carry the fishermen and their smaller boats to the banks, where they remain several days. Often small steamers or launches are used to manage the nets. By these methods great quantities of fish are caught in the deep-sea banks. The lack of fish in the Philippine market has led to interest in these larger fishing enterprises, and the government, as well as private companies, has investigated the matter with a view to improving existing conditions. The reports, however, are unfavorable to the use of extensive methods. The capital which must be invested in such an enterprise and the expenses connected with it are very great. Consequently, to make it profitable the catches must be large; but fish in the Philippines do not seem to be abundant except in the vicinity of coral reefs, and these ruin expensive apparatus. Efforts to use large apparatus were given up until recently, when the Japanese became interested. In Japan a large number of steam trawlers are used in the fisheries. Possibly some such system can be made effective on the coral fishing banks of the Philippines.

MINOR SEA PRODUCTS

Although food is the chief object of the fishing in Philippine waters, certain minor fishing industries are of enough importance, either actual or potential, to be noted. Chief among these is the mother-of-pearl fishing carried on in the southern part of the Islands. This industry exports a product valued at from ₱300,000 to ₱700,000 annually. A small amount of tortoise shell also is exported. The export of prepared *bêche de mer* (trepan) also amounts to several thousand pesos. Among the most important fishing industries which will admit of commercial development in the Philippines is that of sponge fishing. Several excellent commercial varieties of sponges are found here, and a small export has already developed.

SUGGESTIONS FOR REVIEW AND ORIGINAL WORK

1. Importance of fish in the diet of the Filipinos. 2. Commercial forms of fish in the Philippines. 3. How the Philippine supply of fish might be increased. 4. Methods of catching fish. 5. Fishponds.

6. A report on fish found in the local market. 7. Is the demand for fish supplied?

8. The world's fishing banks. 9. The chief kinds of commercial fish. 10. The preparation of fish for commerce. (All commercial geographies.)

11. Varieties of Philippine commercial fish and their uses. (Miller.)

12. The mother-of-pearl, *bêche de mer*, and sponge fisheries of the Philippines. (Miller.)

13. The following figures are taken from the census of 1918:

In eight provinces of the Philippines there are 1149 Filipinos and 21 foreigners engaged in the fishing industry, making incomes of not less than ₱1000 each a year. Their combined capital, including real estate and improvements on fish farms (so designated in the courts) is ₱2,493,010; their gross returns in 1918 were ₱2,946,940, the gross profit being ₱453,930.

The provinces covered by these figures are Batangas, Cavite, Laguna, La Union, Leyte, Pampanga, Rizal, and Sorsogon.

The report by provinces follows:

Batangas: Filipino fishermen, 100; foreigners engaged in the industry, none; capital invested in the industry, ₱163,829; returns in 1918, ₱296,529; gross profit in 1918, ₱122,700.

Cavite: Filipino fishermen, 130; foreigners engaged in the industry, none; capital invested in the industry, ₱300,530; returns in 1918, ₱523,386; gross profit in 1918, ₱223,306.

Laguna: Filipino fishermen, 177; foreigners engaged in the industry, none; capital invested in the industry, ₱48,026; gross returns in 1918, ₱308,463; gross profit in 1918, ₱260,447.

La Union: Filipino fishermen, 85; foreigners engaged in the industry, 1; capital invested in the industry, ₱52,237; gross returns in 1918, ₱122,876; gross profit in 1918, ₱70,639.

Leyte: Filipino fishermen, 219; foreigners engaged in the industry, 7; capital invested in the industry, ₱213,651; gross returns in 1918, ₱463,626; gross profits in 1918, ₱249,975.

Pampanga: Filipino fishermen, 101; foreigners engaged in the industry, none; capital invested in the industry, ₱772,917; gross returns in 1918, ₱322,534. (Much of the capital is in the form of real estate and improvements on fish farms.)

Rizal: Filipino fishermen, 168; foreigners engaged in the industry, none; capital invested in the industry, ₱874,956; gross returns in 1918, ₱449,294. (Much of the capital is in the form of real estate and improvements on fish farms.)

Sorsogon: Filipino fishermen, 169; foreigners engaged in the industry, 1; capital invested in the industry, ₱66,864; gross returns in 1918, ₱260,236; gross profits in 1918, ₱193,372.

In all these provinces the capital invested includes the value of real estate and the improvements on fish farms. This being a fixed value carried over from year to year, the returns on the investment for 1918 alone are considerably more than the ₱453,930 reported.

By means of reports, charts, and tables, compare the fishing industries of these various provinces. When the census of 1918 is available in printed form, compare the fishing data of all the provinces in a similar way.

CHAPTER XVI

FORESTRY

AMOUNT AND KIND OF TIMBER

As has already been stated in the discussion of the soil, it is probable that the entire land area of the Philippines was originally covered with unbroken forests. The second-growth forest, the grass, and the cultivated lands are due to the clearing away of trees. The present forest area is approximately 150,000 square kilometers, or about half the total area of the Islands. Of these 100,000 square kilometers, or about one third of the total land, consists of virgin forest. The second-growth forests may ultimately become of commercial value, but at the present time they warrant small consideration.

In spite of the richness of the Philippines in fine woods for furniture the real wealth of the commercial forests consists in the dipterocarps, timber for structural purposes, such as the lauan, apitong, and yacals. There are two reasons for this: first, much of the 2,000,000,000 board feet of standing timber in the Philippines is made up of the dipterocarp family; secondly, these trees occur in forests sufficiently heavy to be exploited by the use of machinery, while the trees yielding fine wood for furniture, such as narra, acle, and tindalo, are scattered here and there among trees of little or no utility. The lumber output of the Philippines therefore consists principally of lauan and such structural material rather than of the finer woods for furniture.

¹ Unless otherwise noted, most of the data for this chapter is taken from "The Forests of the Philippines," *Bulletin No. 10*, Bureau of Forestry, Manila.

GOVERNMENT REGULATION

In the civilized countries of the world the governments now regulate the utilization of the forests, and protect them from fire and other destructive forces. The necessity for this regulation and care arises from several causes:

1. Lumbermen, if left to themselves, will give little consideration to the reforestation of the land on which they work. They annihilate whole areas, instead of cutting and utilizing only the mature trees, and planting new trees to take the place of those removed. If unregulated cutting is allowed, future generations will be left without a supply of lumber. Government regulation prevents deforestation.

2. Deforestation also causes floods and the destruction of waterways and fertile land. The dense growth of trees on mountain slopes tends to regulate the speed with which water reaches the ground and flows into rivers. In forested areas running water seeps gradually to the drainage streams and finds its way in even flow to the sea. As a result, destructive rushes of water do not occur in the lowlands, and the rivers are deep enough throughout the year to afford navigation. Where the hills and mountains are denuded of their forest, the rain is not regulated in its fall by the leaves, nor in its flow by the cover of leaves, twigs, and other forest litter; it rushes over the surface of the ground into the streams. During a storm the rivers flow in destructive floods; when the rain is over, they fall rapidly and become too shallow for navigation. Forests hasten the making of soil and help to preserve it; floods from bare hills cover the valleys with gravel and sand.

Deforestation in the Philippines may result from either the *kaingin* system or unregulated lumbering.

The *kaingin* system of agriculture has been considered under the discussions of the Subanuns and the soil. It has already caused a loss of millions of pesos to the timber. The making of *kaingin* is permitted, under certain conditions, on

such parts of the public land as are more valuable for agriculture than for forestry. The enforcement of the law concerning the making of kaingin is difficult, however, and timber worth millions of pesos is still destroyed annually.

In the theory of government regulation the government is considered the owner of the forests and the products of the forests. It disposes of these by giving them away or by selling them.

For domestic purposes all second-growth and lower-group timbers and all minor products can be obtained free of charge and without license. If a portion of the public forests, known as a communal forest, is set aside, the inhabitants of a town are permitted to obtain the free products only therein. Under other circumstances licenses must be obtained. In certain cases licenses are issued free of charge: (1) to inhabitants of the Philippines for first-group timbers to be used for the construction of homes of strong material; (2) to miners for all forest products growing on their claims and used in the development of their mines; and (3) for minor products and second-group and other lower-group timbers to be used in the construction of public works.

Licenses which must be paid for are four in number:

1. Miners must pay for timber and other forest products gathered outside of their claims and used in the development of their mines, but the amount which they must pay is only one half of the regular sum.

2. Ordinary licenses, which provide for the collecting of products from certain definite areas, are granted for a term of one, two, or three years, and are renewable at their expiration. Full charges are made for these licenses, and more than one license may be given to exploit the same area.

3. Exclusive licenses grant to a single person, to a firm, or to a corporation the exclusive right to gather forest products from a particular area.

4. Exclusive license agreements are granted for a period of not more than twenty years for large areas which can

have their timber cut without permanent injury to the forests. When such an agreement includes more than a thousand hectares, the concession is put up for bid. The granting of such an agreement is contingent on a guarantee that an efficient plant will be installed, and that a certain amount of development will be done yearly. In this way it is impossible for companies or individuals to obtain forest areas for the purpose of holding them as investments instead of exploiting them.

The forest operations carried on under license are regulated by the Bureau of Forestry. On land which is more valuable for agriculture than for forest growth clear cutting is allowed. Where the land is more valuable for forest than for other purposes, the smaller trees and a sufficient number of seed trees must be left; in certain cases it is not permitted to cut definite species of trees. The forestry employees also see that all the merchantable timber is utilized, that the stumps are not unnecessarily high, and that timber is not abandoned in the forest.

For the purpose of establishing a system of forest charges, the timbers of the Philippines are divided into four groups, and a decreasing rate by the cubic meter is charged according to the value of the timber. The government also regulates the gathering of minor forest products, and charges ten per cent of the assessed market value of each product.

LOGGING OPERATIONS

In general, the logging operations carried on in the Philippines are of two kinds, steam logging and logging on a small scale. In 1917 there were 1906 commercial licenses in force, of which 10 were license agreements, 117 licenses for 1000 cubic meters or more, and the remainder for less than 1000 cubic meters. Almost a thousand licenses were for less than a hundred cubic meters each. Thus it is seen that the majority of the licenses are granted to small operators, who use animal or human power to get the timber to tidewater.

The method of extracting timber by carabaos is crude and wasteful; in connection with the methods of obtaining labor and of financing the enterprise it is the main cause of the high price of lumber in the Philippine market. As a rule, the licensee is not the actual workman. He seldom or never visits the forest, but furnishes a follower or friend with carabaos and other equipment, and receives a certain percentage of the value of the logs hauled to the beach. This follower or friend selects the woodmen, and pays a stipulated amount for the timber delivered on the beach.

The pernicious system of advancing money and provisions, which applies to all Philippine industries, is also found in logging operations, and the laborers are usually kept in debt to the men for whom they work. With the growth of the lumber industry such methods are fortunately going out of use. In many instances the licensee is the lumberman, who pays his workmen a direct wage and treats them fairly. So long as the former system exists, however, and the actual cutting of timber in the woods is left to ignorant workmen without supervision, the cost of timber for structural purposes will be abnormally high. What is needed more than anything else in small forestry operations in the Philippines is competent supervision of logging. With such supervision the cost of cutting timber and removing it to tidewater could be reduced by at least a half.

Certain portions of the Philippine forests are adapted to small logging operations by animal power rather than to extensive operations by steam power. The former will persist, and will be found profitable in isolated patches of the dipterocarp types, and in patches of the molave type, where valuable trees are too far apart to warrant the establishment of extensive machinery.

Several exclusive license agreements have been given to large companies using steam-logging methods and railroads to transport the logs from the forest to the mills at tidewater. These companies exploit large areas containing close forests of merchantable timber, composed principally of lauan and

other trees of the dipterocarp family. There are numerous forests in which such large operations can be carried on; in the near future it is probable that many more companies will invest in this industry. Such logging and milling operations require a large amount of capital, of course, and are therefore carried on by corporations. The larger of these companies employ as many as twelve hundred laborers, most of whom must be brought in. It is therefore necessary for a company of this kind to build a barrio capable of holding at least ten thousand persons. The labor problem in forest operations does not seem to be difficult; for the supply is equal to the demand.

These large lumber companies are of great economic value to the Philippines, since they supply the home market with lumber which otherwise would have to be imported from America. Without the exploitation of the large forests the mature timber goes to waste, because the small licensees are unable to get it out. By close government supervision the mature trees are utilized, and the forests are improved, so that they become a constant supply of commercial timber.

MILLING OPERATIONS

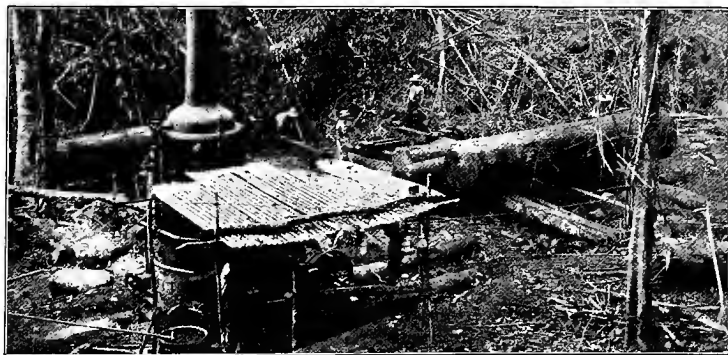
In milling operations two methods are to be noted, hand sawing and steam milling. At the present time hand-sawed lumber can compete successfully with the product of steam mills. The hand sawer is often able to get nine or ten board feet from each cubic foot of lumber; the steam mills cut five, six, or seven board feet from the same amount of raw product. Moreover, all the waste from hand sawing is carefully utilized either for firewood or for other purposes. The steam-sawed material, on the other hand, is all of standard size, and large contractors prefer to use it rather than the irregular-sized lumber from whipsawing. If it were not for this irregularity in size and the scarcity of whipsawers, the hand-sawed material would become a more formidable competitor with the lumber from the steam sawmill.



HUMAN POWER



ANIMAL POWER



STEAM POWER
LOGGING OPERATIONS

PROBLEMS OF THE LUMBER INDUSTRY

The problems connected with the production of lumber in the Philippines are as follows:

1. To overcome the high cost of logging in operations carried on by small licensees. The high cost can be reduced by having paid laborers, better supervision, and reform in the present crude methods and equipment employed.

2. To reduce the high cost of milling by better equipment and better arrangement of the mills now used, by bringing in or training competent men to manage the operations, and by reducing the excessive waste in the steam mills.

3. To lower the high cost of transportation (which is due to the exorbitant charges made by shipping firms) by increasing the number of boats in the Philippines, and consequently by increasing competition in the carrying trade.

These problems are distinctively of a pioneer nature, and will be solved in time.

MARKETS FOR PHILIPPINE LUMBER

There are three markets for Philippine lumber. During the year 1917 the commercial timber produced in the Philippines amounted to approximately 370,000 cubic meters, or 160,000,000 board feet. This was enough to satisfy the needs of the Islands except a little timber and lumber for special purposes, which was imported. Thus it will be seen that the local market in the Philippines is now supplied from domestic timber. This condition did not exist several years ago; for as late as 1910 the Islands were importing almost a third of their commercial lumber. Meanwhile the domestic demand for lumber has greatly increased. The establishment of sugar centrals, coconut-oil mills, and other industrial enterprises, along with the prosperity which they have brought, has increased the demand for lumber, year after year. The increase in the annual production of timber extending over a period of years is noted in the following table:

UTILIZATION OF FOREST PRODUCTS FROM PRIVATE AND PUBLIC FORESTS

[Source: Bureau of Forestry]

FISCAL YEAR	TIMBER		
	First Group ²	Lower Groups ³	Total
	<i>Cu. m.</i>	<i>Cu. m.</i>	<i>Cu. m.</i>
1908	25,586	78,692	104,278
1909	35,357	108,404	143,761
1910	31,962	121,656	153,618
1911	39,312	145,316	184,628
1912	52,091	172,856	224,947
1913	59,422	217,749	277,171
1913 ¹	23,751	77,752	101,503
1914	55,798	241,297	297,095
1915	52,512	226,483	278,995
1916	55,060	288,958	344,018
1917	51,431	318,700	370,131

The production of 1917 does not represent the limits of the domestic market. The output of 1917 sold for record-breaking war prices; with lower prices the amount of lumber used in the Islands will greatly increase, for hard construction will take the place of bamboo and nipa to an increasingly greater extent. Nevertheless, the question of foreign market is one which may at some time become of considerable importance.

¹ July 1 to December 31, 1913.

² First group: acle, baticulin, betis, camagon, ebony, ipil, lanete, mancono, molave, narra, tindalo, and yacal.

³ Lower groups:

Second group: alupag, aranga, banaba, bansalaguin, banuyo, batitinan, bolongeta, calamansanay, calantas, dungon, guiyo, macaasin, malacadios, mangachapuy, palo maria, supa, teak, and tucan-calao.

Third group: agoho, amuguis, anubing, apitong, batino, bitanghol, catmon, calumpit, dalinsi, dita, dungon-late, malacmalac, malapapaya, malasantol, mayapis, nato, palosapis, panao, sacat, santol, tamayuan, and tanguile.

Fourth group: all species which are not included in any of the other groups.

Should the local demand for lumber become satisfied, Philippine timbers will find an excellent market in China, where their reputation is good, and where the demand for lumber is enormous. At the present time there is a small export of lumber, principally to China and the United States; in 1918 it amounted to about ten thousand cubic meters.

The total consumption of commercial lumber in the Philippines (375,000 cubic meters), as compared with that of other countries, is small. The possibilities of the lumber industry here are great, however, for large tracts of virgin forest are available. The thing most needed is capital. It is estimated that the forests of the Philippines could, without injury to them, yield 5,000,000 cubic meters of lumber annually, or about thirteen times as much as they now yield. Although there is prospect of the full utilization of this wealth in the immediate future, it is nevertheless probable that if present investments continue, the next fifteen years will witness an output of more than 1,000,000 cubic meters yearly.

MINOR FOREST PRODUCTS

Minor forest products are also of considerable importance. The fuel used in Philippine households, and to some extent in commercial enterprises, is wood. Most of it is obtained from the forests of mangrove, which makes excellent firewood. Charcoal is another important product. A considerable amount of tan and dye bark is now gathered from Philippine mangrove forests. The possibility of extracting cutch from mangrove bark is worthy of careful consideration. The importance of rattan and bamboo used in the construction of houses and for numerous minor purposes places these two forest products among the most important for domestic use. The amount of rattan formerly produced in the Philippines was not enough to supply the local demand, and a considerable amount was annually imported. During the World War, however, lack of imported supplies stimulated local production. The local

production of rattan is now large, and may continue. At the present time rattan is chiefly gathered by the wild tribes and the hill people, from whom the lowlanders obtain it by trade. The amount and quality of rattan existing in the Islands warrant the gathering of it for export to Europe and America. The demand for bamboo is supplied almost entirely from uncultivated clumps, although this giant grass is often planted. The planting of bamboo for commercial purposes is warranted by its present high price.

The principal minor forest products gathered for export are gutta-percha, resins (particularly almaciga), beeswax, candlenuts, and dyewoods (particularly sappan). Nearly all of these are obtained by trade with the wild tribes and the hill people.

SUGGESTIONS FOR REVIEW AND ORIGINAL WORK

SUGGESTIONS BASED ON THE TEXT

1. Regulations of the Philippine government with respect to the preservation of Philippine forests.
2. Explain how the local production of lumber for domestic consumption has increased the wealth of the Philippines.
3. Explain the relation of the domestic lumber market to our export markets for lumber.

SUGGESTIONS FOR THE STUDY OF LOCAL CONDITIONS

1. Local opportunities for reforestation.
2. Local sources of lumber.
3. Some local manufactures of wood.
4. Compare the cost of a hard-construction and a bamboo house of the same size.
5. Do you think that hardwood houses will ever be within the financial means of the majority of the people in your community?
6. Is there now a tendency to substitute wooden houses for bamboo?
7. Would this tendency be increased if lumber were cheaper?
8. What effect has this on the risk of fire?
9. Which construction makes the more healthful home?
10. What are the comparative ages of a bamboo and a wooden house?

SUGGESTIONS FOR REPORTS FROM REFERENCES

1. The results of deforestation in China.
2. A modern lumber mill. 3. Modern logging operations.
4. Lumber and paper. (Bishop and Keller and other commercial geographies.)
5. Forest areas of the Philippines.
6. Control of the Bureau of Forestry over the cutting of Philippine timber. 7. The grading of timber. 8. The gathering of minor forest products. 9. Forest zones, reserves, and commercial forests.
10. The grouping of Philippine commercial woods (illustrated with samples).
11. Building wooden ships in the Philippines.
12. Relation of forests to mining.
13. The lumber industry in the Philippines (illustrated with charts showing the chief provinces in which lumber is produced, and the principal kinds of lumber manufactured).
14. From the annual figures of the production of timber, on page 355, and the annual report of the Director of Forestry, make a chart showing graphically the increase of the commercial timber industry of the Philippines.
15. Philippine minor forest products. 16. How, when, and where they are produced. 17. The importance and use of each.
18. The possibilities of manufacturing catch in the Philippines. (Miller.)
19. Forests and forest products of the United States. 20. Kinds of lumber obtained. 21. For what purposes the United States uses Philippine woods. (All commercial geographies; the annual reports of the Director of Forestry and Internal Revenue should also be consulted.)

CHAPTER XVII

MANUFACTURING

DENSITY OF POPULATION ; COMMERCE AND INDUSTRY¹

The density of the population of a country is reckoned in terms of the population divided by the total area. The density of the population of the Philippines and of various other agricultural countries is shown in the following table:

Australia	1.5 to the square mile
Brazil	8 to the square mile
Mexico	20 to the square mile
Siam	30 to the square mile
Cuba	55 to the square mile
Philippines	87 to the square mile
India	200 to the square mile
Straits Settlements	350 to the square mile
China proper	500 to the square mile
Java	600 to the square mile

¹ The question of the density of population is important with respect to the supply of food and the character of production. For example, there are five men, each having two hectares of land, which lie in juxtaposition and are of equal fertility. Suppose that these five pieces of land are joined to make one farm, to be worked by the five men. On account of the division of labor thus made possible the crop from the ten hectares will be greater than if each man had worked by himself ; therefore the share of each man will be greater. Suppose that two more men are added. Since a greater division of labor can be carried out by the seven men, the total amount of produce will again be greater, and the share of each laborer will be larger. Suppose that two more men are added. Then, on account of the increase of labor on the land, and the greater subdivision of labor, the gross production will again be increased ; but since the limit of the chemical and physical capabilities of the soil has been passed, the share of each laborer will be less. In the same way, for each laborer added the gross production will be greater, and the proportional production will be less. The more labor put on a given piece of land, the greater will be the gross production from it, and the

In comparison with many countries, especially agricultural countries like China and Java, the Philippines are sparsely populated. In no districts are there such conditions of famine as exist in parts of India and China, where dense populations live on the verge of starvation, and the failure of crops results in thousands of deaths. The Philippines are still below the point of diminishing returns from land. As a whole, they need greater population. In 1800 Java had twice as many inhabitants as the Philippines, but in 1900 it had four times as many. This difference in the rates of increase has probably resulted from the high infant mortality in the Philippines (as explained in Chapter XIII). It is probable, however, that the rate of increase in the Philippines is greater now than it has been in previous times.

The Philippines are not evenly populated (the different densities are indicated on Chart XXXIV). Several regions with rich soils are heavily populated; some regions, such as the Ilocos provinces and Cebu, have a large population in proportion to the fertility of the soil and the amount of arable land. In 1903 Ilocos Sur Province had a density of 400 inhabitants to the square mile, Cebu 340, and Pangasinan 335. On the other hand, vast amounts of fertile lands are not occupied, and many fertile regions are but sparsely settled.

greater the proportional return up to a certain point. After that point has been reached, the more labor put on the given piece of land the greater will be the gross production, but the less will be the proportional return. This is known as the law of diminishing returns from land.

The same law which applies to a small portion of land holds good for a large portion. Hence in any given agricultural community, after a certain population is reached, the law of diminishing returns causes the supply of food to increase more slowly than the population increases. The law of Malthus is that population tends to increase faster than food. Any check on population, or any increase in the supply of food, diminishes the degree to which the law operates in a given region. The checks to population are (1) later marriage and fewer children to the family; (2) war, famine, and pestilence; and (3) emigration. Increase in the supply of food may result from (1) improved means of agriculture, which increases the production per hectare; (2) processes which make food products more nourishing; (3) manufacturing and commerce, the products of which are exchanged for food.

The three regions in which the pressure of population is most greatly felt are (1) the Ilocano provinces, (2) Taal and Lemery in Batangas Province, and (3) Cebu, Bohol, Siquijor, and parts of Oriental Negros. These and the regions in which emigrants from them settle are indicated on Chart XXXV. Other emigrations are from the Batan Islands to Luzon; from parts of Pangasinan to Tayabas; from parts of Bulacan to Tarlac and Nueva Ecija; from central Camarines and central Albay to northern Camarines, Catanduanes, Sorsogon, and Masbate; Ilongos from Panay to Negros; and from Cuyo to Palawan. In addition, government labor agencies have obtained laborers from Manila, Cebu, Iloilo, Bohol, and Antique for Tarlac, Bataan, Mindoro, Mindanao, and Negros. In the past there has been too little emigration from the more crowded districts. In some places this results from the antipathy of the people and a low standard of living. Many laborers have not cared to leave their homes because of fear for their personal safety and the safety of property and relatives left behind, but this is being remedied by peace conditions and better means of communication. Fear of Moros and semicivilized tribes still deters some from going to Mindanao. The clan feeling keeps many people in the place of their birth, even when they realize that they could make a better living elsewhere. Furthermore, there has been opposition "by many landowners doubtless guided, rather than by solicitude for the public welfare, by purely selfish motives, such as the desire to have a constant supply of cheap labor, available for their own private work; cheap labor, thanks to the abundance of laborers in their respective pueblos." ¹

Immigrants from the densely populated parts of the Islands are considered more industrious than the people among whom they settle. Many immigrants, particularly the Ilocanos, buy or homestead land, or become squatters; others become tenants or laborers, and often finally accumulate enough money to buy land and work animals. Many return to the place of their

¹ The quotation is from the report of the Director of Labor, 1911.

PHILIPPINE ISLANDS

DENSITY OF POPULATION

Over 500 per square mile	
100 to 500 " " "	
5 to 100 " " "	
Under 5 " " "	

(Data from Census 1903)



CHART XXXIV

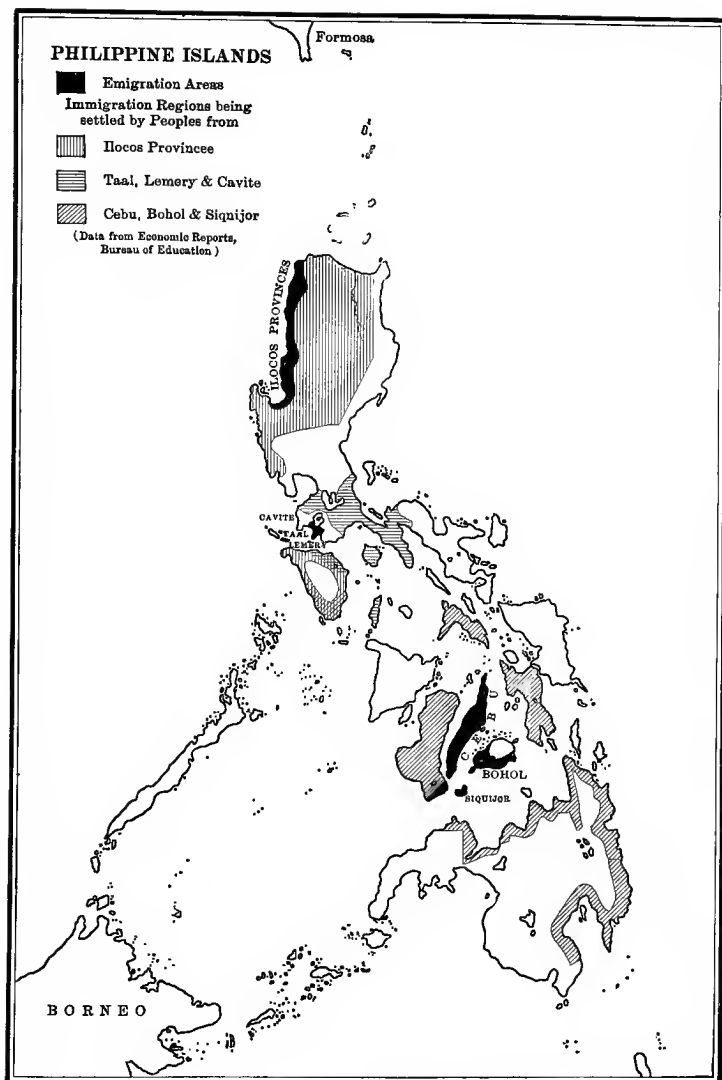


CHART XXXV

birth after they have succeeded in acquiring a little property. This is especially true of the Ilocanos and Taaleños.

In several densely populated regions the additional income obtained from commerce and manufacture supports a much larger population than could exist by agriculture alone. These regions are parts of the Ilocano provinces and Bulacan, the Taal-Lemery district of Batangas, Lucban in Tayabas Province, and parts of Cebu Province and Bohol. In all these regions there are people dependent wholly or in part on manufacture. There are other places, not affected by pressure of population, in which the failure of crops led to manufacture. The weaving industry of Lipa, in Batangas Province, dates from the failure of the coffee crop; the extensive production of mats in Basey is the result of the typhoons which destroyed the rice and coconut crops. In general, manufacture is stimulated by a reduction of the harvest. Sometimes, as in the Romblon mat weaving, the output of manufactured articles decreases when returns from agriculture again become normal; but in many places the impetus of short crops has resulted in established industries. Where large holdings exist the landless population sometimes becomes dependent on manufacture alone, as in the case of the chinela makers and shoemakers of Mariquina, in Rizal.

In most cases the incentive which results in manufacture is the desire for a larger income than can be made from agriculture, money to be spent for amusements, better clothing, the education of the children, and the purchase of land and work animals. The tenant or peasant proprietor obtains from his small plot enough produce to sustain him and his family. Returns from domestic manufactures often provide the only income. Families pursuing household crafts usually have a higher standard of living than those depending entirely on agriculture. This peculiar relation of agriculture and industry is due to the periods of rest between agricultural activities (especially between harvest and planting, and planting and harvest), when the agriculturists are not busy in the fields.

It is chiefly the women and children who utilize these intervals in manufacturing, at the same time performing their regular duties of the household. The men are idle, or engage in fishing, driving, or daily labor for other persons. Sometimes they obtain and prepare the raw material for the women, such as the bamboo splints for hats, the clay for pottery, and so on. The children perform the coarser work, and learn their mother's trade by assisting her. The old and crippled often devote their time to manufacture.

HOUSEHOLD OR DOMESTIC MANUFACTURE

1. The beginnings of manufacture are found in the attempt to provide the home with certain products made from raw materials. In the Philippines, *housework*, as it is called, takes the form of making the following articles: cotton, banana, pineapple, jusi, and abaca cloth; rice and winnowing baskets; fish baskets; fishnets; bamboo and rattan chairs; rope; mats; kitchen utensils; hats; pottery; hammocks; saddles; sieves; boats; harness; plows; harrows; wooden furniture; brooms; and rice mills and mortars.

2. The next stage in manufacture results from the different degrees of efficiency of the workers. Some become more expert than others, and their product is admired and desired. They begin to produce for exchange, especially when their landholdings become small. *Wagework*¹ is carried on when the consumer of the article furnishes the laborer with material and a wage. In the Philippines, pottery, textiles, nets, bolos, steel articles, gold and silver jewelry, mats, embroidery, furniture, agricultural implements, and carving are the most important of the articles so made. The workers usually labor at home, but sometimes, as in the case of weavers, they work in the house of their employer. Some wageworkers become dependent on manufacturing.

¹ The terminology used is Buecher's.

3. In the *handicraft stage* the laborers produce articles from their own material, in anticipation of a demand for them, or to order. In either case the product is sold to the consumer. The articles previously enumerated are made by handicraftsmen. The producers dispose of their wares in various ways. Some sell them in their homes, some have small stores, others vend them in the local market. Some carry their product to neighboring towns on market days, or travel from house to house. Occasionally articles are gathered and kept for disposal at a fair, such as the mats of Tanay, in Rizal, which are sold at the Antipolo festival.

4. As soon as industry grows to national and international proportions, the middleman comes between the producer and the consumer. In household production this is known as the *commission system*. The producer no longer looks for the consumer. The merchant finds and organizes the market, determines its needs, and indicates the nature of the products desired. In the Philippines the principal articles made and sold under the commission system are hats, mats, sinamay, cotton cloths, baskets, pottery, sawali, buri sacks, bolos and other products of iron and steel, rope, embroidery, chinelas, shoes, and knotted abaca. Most of the embroidery and knotted abaca and many of the hats are produced for export; the other products are for the most part consumed in the domestic markets.

In a few instances these products are accumulated in the home, and finally given to somebody to sell on commission. Sometimes, as with Calasia hats a member of the family takes the wares to a retailer or exporter. Often the producers sell for cash to a regular merchant or agent. The advance and debt system is also found in commission household manufacture. Often the merchant advances the raw material; sometimes he advances money, food, and other things in anticipation of goods; sometimes he owns the looms and other implements with which the work is done. The condition of the housework laborers under such an advance and debt system is often as

bad as that of agricultural workers under the *kasama* system. They are subservient to the will of the merchant who controls their labor and output. In most towns there are local brokers or agents who gather up the product of the place and dispose of it to general brokers, domestic dealers, or exporters. In some towns two or three of these persons control the industry. When not effected through export houses closely in touch with the trade, such control sometimes causes inertness, as is the case in the *sabutan-hat* industry of certain towns in Laguna Province. For the export trade the form and quality of the output is very important, and is subject to change of fashions in foreign countries. Export houses control these matters through the brokers and agents; in certain new industries they place the monopoly of buying in the hands of a few persons, to exercise better supervision over the workers. Where there are independent peasant proprietors, and where wage-work and handicrafts coexist with commission work, so that the producer may sell direct to the consumer, control by middlemen is at a minimum. This is also true of towns producing and exporting articles for which there is sharp competition. This is seen among the Ilocano peasant proprietors, and in the *buntal-hat* trade of Lucban, in Tayabas, and the knotted-abaca industry of Lipa, in Batangas.

Export demand often causes an industry to be carried on under the commission system only. Usually, however, the community of manufacture is built up on all the different systems. The needs of the consumer or of the worker seem to determine which of the systems is used; the same worker may be under each of the different systems at different times. For example, a mat maker may use the mat he makes (house-work); he may make a mat to order for some other person from materials furnished by the latter (wagework); he may make a mat from his own materials and sell it to the consumer (handicraft); finally, he may make a mat and sell it to a merchant, who again sells it locally or ships it away (commission system). All four systems usually exist together, and

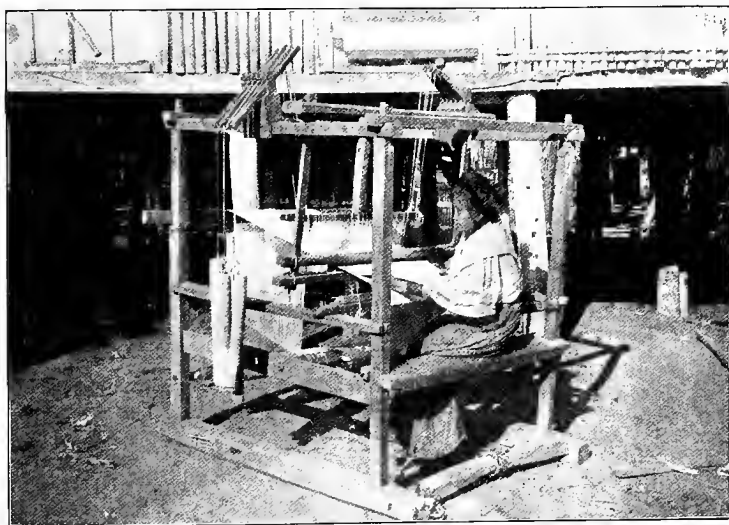
the one used at any particular time seems to depend on the demand for the articles and the needs of the workers.

The wage received in commission work depends on the demand for the article manufactured and the influence of brokers. In certain textile industries of Iloilo, where the weavers are largely controlled by brokers and the product competes with imported, machine-made cloths, the wage is estimated at ₱0.09 or ₱0.10. Here the worker, if dependent on weaving alone, is apt to sink deeper and deeper in debt to the broker. Usually the wage is the same as that received in agriculture, from ₱0.30 to ₱0.60 a day. The wage is highest in the industries producing chiefly for foreign demand, which is not easily controlled by brokers. The hat weavers of Lucban make from ₱0.50 to ₱1.20 a day; the workers in knotted abaca often clear more than ₱1 when prices are high.

The value of household products consumed in the Islands has not been determined. Thousands of yards of cloth are woven and used annually. In several towns almost every house has a loom. Thousands of hats and mats are annually disposed of in the local market. Practically all the pottery used is of domestic manufacture. In 1918 hats valued at more than ₱1,800,000 were exported, knotted abaca valued at more than ₱1,000,000, embroidery valued at more than ₱4,300,000, and laces, textiles, baskets, and the like in smaller amounts. In comparison with the millions of pesos' worth of household manufactures annually consumed in and exported from the countries of Europe, Japan, and China the output of Philippine households is small. When Europeans first came to the Islands, the natives already practiced hand weaving, loom weaving, and other arts; the newcomers taught them crafts, such as embroidery, wood carving, and metal work. That these industries have not grown to greater proportions is due (1) to the lack of the industrial and commercial idea; (2) to the localization of industries in one barrio or town; (3) to the lack of improvement in methods; and (4) to the lack of a market.



HAT WEAVING



LOOM WEAVING

TWO PHILIPPINE HOUSEHOLD INDUSTRIES

In the last few years the production of household industries has been increasing. It can be measured in the foreign trade by the export of hats, which was less than 200,000 in 1907 and more than 1,600,000 in 1912; and by the export of embroidery, which was almost nothing in 1912, and amounted to more than ₱4,000,000 in 1918. Greater production of commercial goods in the home is coming about as the result of the industrial and commercial idea now felt in the Philippines. The established industries are spreading beyond the limits of the barrios and towns, to which a certain immobility has heretofore confined them. New industries are also being founded through individual effort and industrial work in the schools; for example, the chinela and shoe industries of Gapan, Nueva Ecija, and Mariquina, in Rizal, have grown from the success of one man or family. The Malalos balangot slipper, now sold all over the Islands, was first made at Malalos, in Bulacan, in 1907, by a Japanese. The large basket industry of the town of Bulacan had its beginning in 1908, in the teaching of basketry in the schools. Industrial instruction in the schools has been general only during the past few years; but the nucleus of several household industries, such as slipper making, basketry, textile, mat, and hat weaving, embroidery and lace making, has already been established in many towns. The aims of the Bureau of Education in promoting its industrial program have been most practical. The attempt has been to turn the pupils directly and normally from the public schools into an industrial life which will enable them more adequately to meet their increasing needs. Contrary to the prevailing theory and practice of certain other countries, industrial instruction in the Philippine schools is highly commercialized.

Commercial firms are beginning to invest money to finance household industries, the large hat production of Apalit, Pampanga, and neighboring towns being due to their backing. Moreover, free trade with the United States has opened up a large market. The entire production of baskets can be placed there for years to come. In 1918 the United States imported

almost the entire embroidery output of the Philippines, and all the laces. Most of the hats exported from the Philippines, valued at more than ₱1,000,000, now go to the United States.

There is still opportunity to establish large household industries in the Philippines, and their recent introduction and growth have been rapid. Care must be taken that the workers receive the greatest possible return, and that they are not exploited by the middlemen. If household industries are carried on in connection with agriculture, either by the agriculturists themselves or by certain members of the family, industry is made secondary to agriculture, and the workers are placed in an independent position. The greater the intelligence of the workers, the less advantage can be taken of them; therefore the schooling of the masses will make them free agents in housework as well as in agriculture. Much division of labor, whereby the worker does only a small part of the work on a given article, places him at a disadvantage, for he then sells his labor only. If he makes a finished object, he can sell it to anybody. The government may stand ready to purchase and dispose of articles from workers who are being exploited. Workers may coöperate to dispose of their goods.

It is always possible to produce an inferior article, and it is often possible to reduce the cost of production at the expense of the laborer. In the large cities of the United States and Europe both methods are employed to meet competition. The working of laborers in their homes and in shops (sweatshops) for the purpose of getting the greatest amount of labor from them at the least cost is called "sweating." The lowering of quality and the sweating are both ultimately disastrous. The reputation of the articles suffers, and the efficiency of the laborers is reduced. Either laborer or merchant may ruin an industry by the shortsighted policy of immediate interest, exploitation.

The value of household industries in the Philippines rests on their correlation with agriculture: the utilization of spare

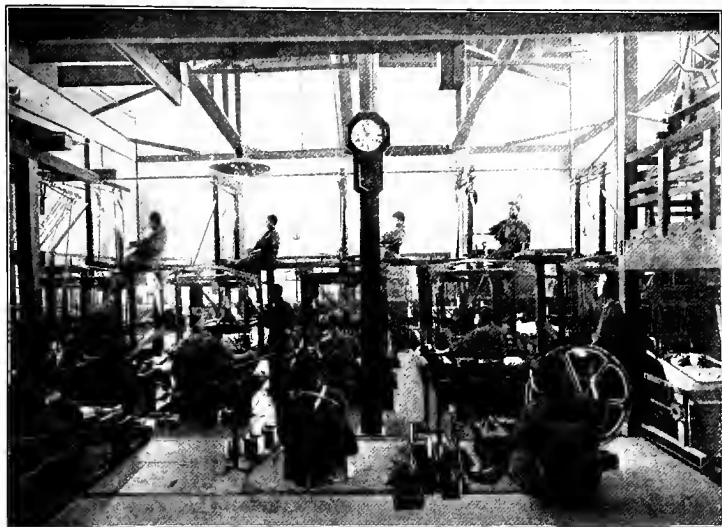
time for production, the returns from which can be employed in increasing the standard of living, educating the children, and purchasing land, implements, and work animals.¹

FACTORY MANUFACTURE

Under the commission system capital controls the marketing of the products of an unorganized army of laborers; the factory system divorces the workers from agriculture, and organizes them into a compact and well-disciplined body. The embryo of the factory is occasionally encountered in the Philippines, in loom weaving, for instance, where the original outlay for machinery is an expense which often cannot be afforded by the laborer. Sometimes as many as ten looms are found in one house; they are worked by laborers hired by the day. In such a case the owner is able to supervise all the processes of manufacture. Sometimes women are employed to knot abaca in the home. Chinelas are often made in small factories. Dyeing with indigo is sometimes done in factories. The factory system with hand labor is important in Europe, China, and Japan, but the Filipinos prefer to work independently if they can, and the abundance of land in the Islands usually permits them to do so. Attempts to evolve factories from highly organized household industries, such as the hat industry of Luchan, in Tayabas, have been failures. The only successful factories employing handwork are to be found in the tobacco industry; for instance, in the cigar factories of Manila, where hundreds of workmen are grouped in one establishment, little machinery is used. In general, therefore, it may be stated that manufacturing and agriculture are still closely connected in the Philippines.

Machinery is usually associated with factories, since it must be placed at the source of power. The laborer must be brought to the machinery. He now works at regular

¹ In Batangas wages from the knotted-abaca industry have enabled many tenants to purchase land. See pp. 234, 235, 254, 257, 258, 261.



JAPANESE WEAVING BY HAND



POWER LOOMS
FACTORY WEAVING

hours, and makes his home in the narrow confines of a city; thus his divorce from agriculture is complete. Machinery and the factory system have largely displaced household manufacture because (1) certain articles can be made by machinery and not by hand, (2) machinery produces in large quantities, (3) it is cheaper than hand labor, and (4) greater division of labor and utilization of by-products are possible and result in a further decrease in the cost of production.¹

¹ The members of a Philippine agricultural family are usually jacks-of-all-trades: farmers, carpenters, fishermen, weavers, and the like. Nevertheless, division of labor among the sexes is carried out. The women plant the rice, carry on the household industries, and prepare and cook the rice. The planting and harrowing of the fields, the construction of houses, and fishing are usually left to the men. In many places are found a few artisans, such as barbers, carpenters, and blacksmiths, who devote themselves to their special work. The localization of industries is a form of division of labor, and is largely the result of a local supply of raw materials. It is found among the mountain peoples (see Chapter I) and occurs to a much greater extent among the Filipinos.

Division of labor may be summed up as that system of production in which one man or a set of men makes one part of an article or performs one step in the work. In some household manufactures in the Philippines it is not observed. In weaving mats and cloth, and in making clay jars, bamboo chairs, and bolos, the workers may do all the steps required to complete one article. In mat weaving, for instance, the weaver may cut pandan leaves and do all the stripping, bleaching, weaving, and selling. In bolo making the blacksmith may buy materials from the Chinese store (no matter how many kilometers away the market is), go out to the forest to burn wood for charcoal, form and finish the blade, put on the handle, and on the market day sell his finished article in the town.

Usually, however, a certain division of labor occurs. In the making of copra different persons or sets of persons often do the picking, transporting to the kiln, husking, splitting, placing on the kiln, removing the meat, and sacking. In the production of abaca in quantity one man cuts down the stalks, another transports them to the stripping sheds, another separates the petioles, another strips the fiber, and still another puts it out to dry. The weaver of sinamay often buys the knotted abaca from another person. In the cleaning of rice division of labor takes place where one set of laborers pounds the paddy, another winnows it to remove the husk, another pounds the rice to polish it, and a fourth group winnows it to remove the bran.

Where division of labor can be carried on, the cost of producing an article is greatly lessened because time is saved and fewer tools are used. The laborers do not have to change from one part of the work to another, and therefore become much more skillful and do the work not only better

There are few factories in the Philippines. Distilleries are about the only ones found in the provinces. Most factories are in Manila and a few in the other ports of entry. The most important are tobacco factories, rectifying plants, lumber mills, ice plants, ropewalks, cotton mills, shoe factories, and match factories. Oil factories are a recent development.

but also in less time. In the Philippines the women usually do the transplanting of rice, because they are recognized as quicker and more skillful than men. Cigarette packers become so expert they do not have to count the number of cigarettes that they grasp; their sense of touch enables them to determine the number in the hand. The joining of two bamboo hats to make a double hat is regarded as a separate part of hat weaving in Baliuag-Pulilan, in Bulacan Province. The making of buntal hats in Lucban is divided into three steps: (1) the weaving of the crown and brim, (2) the weaving back of the fibers along the edge, and (3) washing and ironing the hat and curling the brim. Each group of workers is skilled in its particular part of the manufacture. In bolo making the assistants (apprentices) hammer out the rough bolo which the master workman finishes.

Tools are saved by division of labor, since they do not have to be duplicated. Instead of one man's needing all the tools for the production of cleaned rice, for instance, each laborer needs only the one connected with his particular part of the work. Another advantage of the division of labor is that it provides light work for the young, the aged, and the weak, and common labor for the unskilled. For instance, among the Igorots the division of labor in agriculture is so arranged that the children and the aged do the light work, such as picking up the camotes which have been overlooked in previous harvests, and guarding the fields. In making single hats the skilled weavers begin the hats and weave the crown and the brim; the children and the unskilled workers finish the hats by weaving back the fibers along the edge. Children often knot the abaca used by their mothers in weaving. The modern centrals will allow the planter to devote his entire attention to raising sugar cane and leave to experts the manufacture of the sugar.

In factory work where machinery is employed, the tendency is to give each process to a different laborer. Hence, in the making, some articles, such as shoes, may pass through the hands of a score or more of men.

To have division of labor, extensive production is necessary. For instance, it would not pay to have a division of labor in the cleaning of one cavan of rice, or in the production of copra from a few scores of coconuts, or in the making of five shoes. It is necessary to have hundreds of cavans of palay and thousands of nuts or shoes.

A by-product is a secondary product obtained in the process of manufacture. Thus molasses, bagasse, and the leaves are by-products of sugar; husk, bran, binlid, and straw are by-products of cleaned rice. The principal product of the coconut is the oil obtained from the copra. The by-products are the oil cake, which is used for feeding animals; the husk, which is used

HOUSEHOLD VERSUS FACTORY PRODUCTION

The persistence of household industries in the face of competition with factory products may be accounted for:

1. Inertia often causes a household industry to persist even at prices which do not give a living wage. Many old cotton industries, such as that of Taal, in Batangas, in which cloths resembling machine-made textiles are woven, are in this condition. These are gradually growing less numerous, however. Modern shoe factories recently established in Manila have somewhat injured the home shoe industry at Mariquina, in Rizal. The leather employed in these factories is much superior to that used in Mariquina; hence the product of the former is preferable to that of the latter, even at a higher price. A large number of the skilled shoemakers of Mariquina are now working in the factories of Manila; they are making more money than they were formerly earning in their homes.

2. Where machine-made articles must yield a profit to several middlemen, they are often sold in a given region at higher prices than like articles produced there by hand.

3. Certain articles cannot be made by machinery, such as straw braids for hats, knotted Manila hemp, plaited hats, and most varieties of baskets.

4. The demand for certain articles, such as the "gee" strings of the mountain peoples, is not great enough to warrant special machinery for their manufacture.

for fuel; the useful coir fiber, which is obtained from the husk; the shell, which is made into household utensils for domestic use, and which can be beautifully polished and carved; and the milk, which can be made into vinegar. A difference should be noted between a derived product and a by-product. Candles, for example, are not a by-product of the coconut, but a product derived from the main product, coconut oil. Sinamay and rope are not by-products of abaca fiber; they are articles made from it. The waste from the production of abaca fiber, useful in making paper, is a by-product, since it is obtained as an additional product when abaca is stripped. In many manufacturing industries the profits are derived entirely from the by-products.

5. Household workmen can often understand and satisfy the demands of style better than the factory. This is seen in the Ilocano cloth industry.

6. A prejudice often exists in favor of handwork, because such products are supposed to be better made. This is often mere sentiment; still, in certain articles finer and more perfect work can be done by hand than by machinery. This applies particularly to embroideries and laces.

7. In housework the workman labors for himself. Hence his interest in it causes his highest technical skill and his whole artistic sense to be embodied in the finished article. This interest persists in wage, handicraft, and commission work; for this reason handmade articles possess individuality and artistic qualities not obtainable in machine products.

Household manufacture the world over is not waning. On the contrary, it is being revived, but is restricted to the spheres in which it has peculiar advantages. Its greatest importance is supplementary to agriculture.

LOCATION OF MANUFACTURE

1. *Raw material.* The supply of raw materials is an important factor in determining the location of manufacture. Thus rice mills are situated in rice-growing regions, sawmills in the forest, and factories near good harbors or railroad centers, where raw materials can be transported cheaply. The Philippine nipa shingle industry and the distillation of alcohol from nipa tuba are centered in the river deltas on which large nipa swamps grow. The household manufacture of sinamay is largely confined to the abaca regions. The production of hats and mats from buri-palm straws (buntal, Calasiao, and buri) is established near the large buri areas in Luzon. The chinela and leather industries of Gapan, Nueva Ecija, are dependent on each other.

2. *Cheap and efficient power.* Often raw materials are transported many miles to the supply of coal or to water power, since it has been found cheaper to take the raw materials to the

power than to take the power to the raw materials. Thus iron ore is carried from Spain to England, and from the mines about the Great Lakes to the coal of Pittsburgh to be smelted. Raw cotton is sent from southern United States to the water power of New England, and to the coal of Great Britain. Several factories are built in Manila in preference to other places because coal can be imported into Manila at a lower cost.

3. *Skilled and cheap labor.* The amount of skilled and cheap labor procurable in a given place largely determines the extent of its manufacturing. In the Philippines raw materials are often sent from towns where labor is hard to get to towns where there is an adequate supply. This is particularly true of such household industries as hat weaving. The buntal straw from which hats are made in Lucban, in Tayabas, is imported from the buri area, where no hats are made because there are no weavers. The hats made in other towns are usually finished in Lucban, since skilled laborers are available. In the same way buri midribs are imported into Calasiao, in Pangasinan, from other towns where the raw materials exist, but where a labor supply is not available.

By cheap labor is not meant labor which receives low wages, but labor which produces much in proportion to the wages given. Often labor which receives low wages is not cheap in the end, for it produces little wealth. Thus cotton cloths produced in India by poorly paid labor cannot compete with those of England produced by labor which receives much higher wages. An English laborer produces more in proportion to his wages than an Indian laborer, and English labor is therefore cheaper. Labor must be skilled where machinery is used, and the supply should everywhere be large and constant. If there are many laborers one day and few the next, no enterprise, either manufacturing or agricultural, can be carried on. As labor is the most important of the factors which determine the cost of an article, so it is one of the most important which determine the location of industry.

In the past the Filipinos have done little work with tools or machinery. The artisans of the Philippines have been Chinese carpenters, cabinetmakers, and masons. The Filipinos have been mostly employed as tailors, silversmiths, goldsmiths, painters, and blacksmiths, and in structural work which necessitates climbing to a considerable height. They are now taking up other trades to an ever-increasing extent. In provinces where skilled workmen formerly had to be imported, a sufficient supply of local labor for normal building operations is now available. The implements and methods are primitive, adopted from the Chinese.

The Filipinos have proved themselves especially efficient as sawmill hands, cigar makers, and tenders of cigarette machines. They are also proving satisfactory in machine shops, ship-building and repair shops, railroad work, and the relatively numerous factories now established in Manila. Capitalists are investing money in factories dependent on Filipino labor; this is an encouraging sign.

The problem of training a sufficient body of men to use tools and take charge of machinery is difficult, since the Filipinos have been agriculturists. Their proficiency in handwork, however, has made it easier to build up a class of Filipino artisans, such as is now being formed in factories and Insular and Federal shops. The schools are turning out trained artisans, and are teaching woodworking and other arts and trades in their general course. They have assisted greatly in the change of feeling toward trade and factory work, so that these are coming to be recognized as honorable and dignified methods of earning a living. In modern industrial nations it is felt that conditions of apprenticeship in the workshop or factory are not such as to give all the training necessary to those who are to engage in trade and industry. They are one-sided and imperfect. Technical schooling is becoming more necessary for the training of workers. Sometimes this is given in the factories; more often it is left to schools. The

present demand for skilled labor in the Philippines tends to enhance the importance of technical education here.¹

The idea of trade and labor unions showed itself in the Philippines early in the present century. Unions are combinations of labor which try to meet the concentration of power in the hands of employers (an outgrowth of the factory system) by a similar concentration on the part of the employed. Unions do not exist for the purpose of striking. The strike is one of the means by which they try to obtain their ends. The modern unions of the better sort have for their objects the protection of the worker against encroachment by employers; the uplift of their members; the raising of their standard of living; an increased wage; and mutual insurance for sickness, accident, or death. In their relations with employers unions resort to discussion, contract, arbitration, and sometimes to the strike.

The labor unions established in Manila in 1901 and 1902 under the auspices of a general labor union or federation were formed by a group of men, not laborers themselves, for personal and political ends. They had none of the objects noted above, and illustrate the mischief that false leaders may accomplish with a body of somewhat ignorant workers. The federation was disbanded by the government a few months after its establishment, because of its seditious tendencies.

A new organization, similar to the first, has managed to keep alive, but its activities have not been effective; its organization is too complex, and it has tried to do too much at once. Meanwhile trade unions, namely, unions of those who belong to the same trade, have flourished under autonomous management, and have proved to be more useful than the federation, because they have been more easily managed and have been able to frame different policies to suit the various

¹ The typographical trades in the Philippines offer an excellent example of the success of the Filipinos as skilled workers. In the Bureau of Printing, of the 466 employees more than ninety-three per cent were Filipinos. Their work has received the highest praise from authorities (*Annual Report of the Director of Printing*, 1912). In 1918 practically all were Filipinos.

needs of the separate groups of workers. To-day they are the organizations that uphold the interests of the laboring class.

The "Union de Tabaqueros de Filipinas" is the largest and strongest union. The machinists' and seamen's unions are strong organizations. There are also smaller trade unions. Successful and unsuccessful strikes have been carried on, but the tendency to strike is becoming less strong. To-day trade unionism rather than general labor unionism is the tendency.¹

In 1918 the total number of labor societies in Manila was 143, and the membership more than 147,000. No data are available with respect to labor organizations in the provinces. In this same year 84 strikes, 63 of which were in Manila and the rest in ten provinces, involved 16,000 workers, 11,000 being in Manila. Of these 84 strikes, 50 resulted from petitions for increased wages, 15 from personal causes, such as sympathy for fellow laborers or feeling against foremen, and 8 from requests for the general improvement of conditions. Of these strikes 62 resulted favorably for the laborers. It must be remembered that prices and the cost of living were increasing in 1918.

In this year there was also organized in Manila the first committee on arbitration, the Committee on Conciliation and Arbitration of the Union de Tabaqueros de Filipinas and of the Manila Tobacco Association. With respect to arbitration the terms read as follows:

7th. That the "Manila Tobacco Association" and the "Union de Tabaqueros de Filipinas" shall appoint three representatives for each of the said bodies, which representatives shall constitute a "Committee on Conciliation and Arbitration," to which committee shall be submitted all questions and matters which might arise hereafter between employers and laborers, both parties being prohibited from taking radical measures without first submitting their controversies and conflicts to the said Committee. The decisions of this Committee, in order that

¹ I am indebted to Mr. Conrado Benitez for data on unions in the Philippines. *Bulletin No. 58*, Bureau of Labor, Washington, D. C., may be consulted for details of the early history of the movement.

they may be valid, shall be approved by at least two members of each party. This Committee can also, after a previous agreement, appoint an arbiter, whose decisions shall be compulsory to both parties.

8th. The Committee on Conciliation and Arbitration mentioned in the preceding paragraph shall be vested with power to issue rules and regulations tending to the obtaining of its aim, which is the cordial harmony between Capital and Labor, or between employers and their laborers and employees.

Another innovation which also occurred respecting the relation of laborer and employer is the collective contract of labor agreed upon between the printing establishments of Manila and the "Union de Impresores de Filipinas."

The principal terms contained in this contract are as follows:

1. No signing printing establishment shall admit into its shops any laborers not affiliated with the "Union de Impresores de Filipinas."

2. The daily work shall be eight hours.

3. All work done outside the hours designated shall be considered extraordinary, and laborers shall be paid 50 per cent more of the wages agreed upon.

4. The fixing of a minimum scale or rate of wages which should be at least ₱2 for any classified laborer in printing establishments.

5. The regulation of apprenticeship. In order that anyone may be considered an apprentice, it is required that the applicant be at least 14 years of age and that his knowledge of reading and writing be at least of primary grade.

6. The organization of a committee on Conciliation and Arbitration, which shall be composed of not more than three representatives from each party; the decision of the said committee being compulsory to both parties. Upon request of any representative from any party an Arbiter can be nominated. This nomination shall have the consent of all the members composing the committee, and the decision of the Arbiter so designated shall be compulsory to both parties, with no further investigation.

4. *Low cost of transportation.* Manufacturing cities must be near their markets, or connected with them by some means of cheap transportation, so that their products may compete in price with the same articles manufactured in other places.

Cheap methods of interisland transportation have made Manila and other ports of entry successful manufacturing centers. Better communication with Europe and America will do much for Manila as a factory city.

5. *Capital*.¹ Increase in manufacture, and the accumulation of capital, are coincident. In the transition from housework to commission work we see the worker gradually emancipated from the soil, and the growth of capital. The looms, yarn, tools, and implements of household weavers are capital;

¹ Capital is that part of wealth which is used for the production of more wealth. Wealth therefore is or is not capital according to its use. Thus the fodder given to a carabao is capital because the animal helps to produce wealth, but fodder given to a race horse is not capital because no wealth is produced by the race horse. A building used as a factory is capital, but a building used for a clubhouse is not capital. Food is the most simple form of capital. At the end of the harvest the farmer has enough food to last him for a number of months. That is his wealth. He may or may not use it as capital; if he is idle, it is not capital; if he produces, it is capital.

The growth of capital is well illustrated in the economic stages exemplified by the Negritos, Subanuns, and mountain peoples. The amount of wealth in the form of implements, tools, and food employed to produce further wealth increases with each culture stage.

The growth of capital is the result of saving by the individual, as is often illustrated in the increase of animals. Batangas Province furnishes instances of families who raise a few chickens, sell them for a small sow, and raise the sow and a litter of pigs, which they trade for a calf. Thus a work animal is obtained. The matter of saving has already been discussed in connection with land tenure, and the incentive toward ownership of a farm which the possession of a work animal gives the tenant has been explained. Saving is the great law of capital.

The forms which capital takes can be grouped as follows:

1. Productive improvements on land.
2. Buildings, such as barns and factories, devoted to productive industries.
3. Means of transportation, such as roads, canals, railroads.
4. Raw materials.
5. Auxiliary materials, such as coal and lubricating oils.
6. Tools and machines.
7. Domestic animals.
8. Money, weights, and measures.
9. Stocks of goods in stores and warehouses.
10. Books, instruments, and the like.

Like the word "wealth" the word "capital" has other meanings than the economic. From the point of view of the individual, capital consists of all his possessions which bring him wealth. Thus a note or a mortgage is

so are the advances of food and material made by brokers. In the factory system complete emancipation is effected, and the laborer becomes dependent on the capital of others. The availability of such capital therefore helps to determine the location of factories.

The capital possessed by the Filipinos is not large; it is tied up in agriculture. Most of the capital invested in Philippine manufactures is foreign, and any great increase in manufacturing must result from foreign capital, for even with great saving the Filipinos cannot soon accumulate enough surplus wealth to finance large enterprises. There is no doubt that the Filipinos can save. Such primitive Malays as the Bontoks often have in their granaries the rice crop of five years before. The Ilocanos are probably the most saving of the Filipinos. In Hawaii, it is noted, the Filipinos usually spend all that they first earn, and then settle down to regular work. When they find they can earn more than enough to live comfortably, they begin to save.

With the establishment of peace and security the prosperity of the Philippines and the domestic capital of the country have increased. The Postal Savings Bank was established by the government to encourage small savings by providing a place of safe deposit. In 1918 there were more than 78,000 depositors; the deposits were ₱4,928,152.

The savings deposited in commercial banks indicate the growth of wealth in the Islands. In 1907 they amounted to about ₱560,000; in 1912, to almost ₱1,000,000; and in 1918 to more than ₱1,600,000. The total resources of the Philippine commercial banks are even a better index of the accumulation of capital in the Islands:

capital to the holder. But from the point of view of political economy (that is, from the point of view of the country as a whole), notes, mortgages, and such commercial paper are not capital. Thus a mortgage on a factory is not capital to a country. The factory is the capital, and the mortgage merely shows that somebody owns a part of it. Economic capital consists only of that wealth which produces more wealth. Interest is payment for use of capital, just as wages are payment for labor.

YEAR	TOTAL RESOURCES
1907	P 34,000,000
1910	46,000,000
1913	67,000,000
1915	71,000,000
1916	122,000,000
1917	239,000,000
1918	400,000,000

In 1918 the Bureau of Commerce and Industry estimated that the grand total of capital in operation by domestic and foreign concerns exceeded ₱500,000,000, of which ₱100,000,000 represented American and foreign capital. The future will probably see an increase in the American and foreign capital invested here. The larger part of the domestic capital of the Philippines has been of recent growth. Corporate activity became noticeable in the Islands in 1906. Since then more than three thousand corporations and partnerships have been registered. The purpose for which they were organized indicates the relative importance of capitalistic enterprises in the Islands. The table on page 386 shows the need of capital to develop natural resources and manufacturing.

THE PHILIPPINES AS A MANUFACTURING COUNTRY

UNFAVORABLE CONDITIONS

Lack of highly developed inter-island and land transportation facilities.

Distance from the markets of America and Europe, and poor transportation facilities to those markets.

Amount of labor is limited and is demanded in agriculture; labor lacks skill in handling machinery.

Lack of power.

Lack of capital. What capital is available is required for the development of agriculture.

FAVORABLE CONDITIONS

High cost of transportation favors working up raw materials into semimanufactured form; for example, coconut oil, centrifugal sugar.

Agricultural system favors household industries. Labor is skilled in handwork; for example, embroidery, cigar making.

Abundant agricultural raw materials. Metals are available, but not developed.

DOMESTIC CORPORATIONS INCORPORATED FROM MARCH 30, 1906,
TO JUNE 30, 1918

CLASS	NUMBER	CAPITAL SUB- SCRIBED	CAPITAL STOCK
I. Natural resources	379	P 35,449,008.00	P 67,969,046.00
1. Mining	109	21,714,279.00	39,019,900.00
2. Agriculture	228	11,178,279.00	21,290,146.00
3. Lumbering	31	2,199,330.00	6,959,000.00
4. Fishing	10	277,120.00	620,000.00
5. Others	1	80,000.00	80,000.00
II. Commerce	324	37,156,032.00	72,443,050.00
1. Wholesale and retail	143	10,798,880.00	26,655,530.00
2. Transportation	85	9,744,496.00	19,272,020.00
3. Banking and insurance	13	9,400,000.00	11,250,000.00
4. Import and export	31	5,380,475.00	9,125,000.00
5. Drug store	10	596,400.00	2,330,000.00
6. Warehouse	9	413,650.00	1,690,000.00
7. Commission and brokerage	10	169,100.09	406,000.00
8. Others	23	653,031.00	1,714,500.00
III. Industry	205	20,055,032.05	49,502,577.30
1. Construction and repair	28	4,368,255.00	6,687,500.00
2. Distilleries and breweries	22	1,173,250.00	8,257,500.00
3. Electric light and power	14	2,625,290.00	6,687,500.00
4. Vegetable oil	17	1,578,300.00	5,104,500.00
5. Cigars and cigarettes	10	808,832.75	1,992,000.00
6. Printing and publishing	32	479,661.00	1,352,210.00
7. Shoes and other leather goods	3	451,606.00	902,000.00
8. Ice and cold storage	10	379,010.00	611,000.00
9. Rice mills	8	254,767.00	375,867.00
10. Others	61	7,936,060.00	13,542,000.00
IV. Miscellaneous	478	2,938,032.44	17,246,494.44
1. Recreation	49	775,214.00	2,083,200.00
2. Hotels and restaurants	10	527,045.00	1,262,600.00
3. Educational and religious	259	232,965.00	487,000.00
4. Clubs and societies	134	8,980.44	38,194.44
5. Others	26	1,398,828.00	13,375,500.00
Total	1,386	P 95,603,104.00	P 207,161,167.74

NOTE. Twelve corporations reported to have been dissolved are not included.

SUGGESTIONS FOR REVIEW AND ORIGINAL WORK

SUGGESTIONS BASED ON THE TEXT

1. Are the Philippines a densely populated country? 2. Prove your answer with comparative figures. 3. How many fold may the Philippine population be increased before the country will become as densely populated as an agricultural country?

4. Improvement in agriculture in relation to diminishing returns from land.

5. Explain why dense populations develop manufacturing.

6. Explain why manufacturing regions are densely populated.

7. Density of the population of the Philippines in relation to (a) seasonal labor, (b) the settlement of regions newly opened to agriculture, (c) manufacturing and commerce.

8. Illustrate the stages in manufacture by examples from the Philippines. 9. Why will household production of manufactured articles continue in the Philippines?

10. Figures which show the growth of capital in the Philippines.

11. Name five companies in the Philippines whose stocks are now available for investors. 12. Which do you think a good investment? 13. Why?

14. Japan imports abaca fiber worth ₱4,000,000, and reexports it as braid worth ₱14,000,000. Explain how this is a loss to the Philippines. 15. Name three partly manufactured products that the Philippines have begun to export in the past few years. 16. Why is this more beneficial to the Philippines than the export of the raw products? 17. Name some other raw products that might be exported in semimanufactured form.

18. Are conditions favorable or unfavorable for manufacture in the Philippines?

19. In 1918 the oil mills in Manila were forced to stop for a considerable part of each working day because they were not able to secure electric power. Using this as an example, explain the necessity for abundant power in manufacture.

20. If electric power is developed in the Philippines as it has been in Italy, what effect might its introduction into households have on the development of household industries in the Philippines?

21. In 1918 about 8000 emigrants were sent to sparsely populated regions of the Philippines; these emigrants went from Cebu and Iloilo for the most part. In the same year about 2700 emigrants went to Hawaii, of which more than 1000 emigrated from Cebu, 850 from Ilocos Norte, and 300 from Oriental Negros. Comment on these emigrations as to (a) the effect of density of population, (b) the advantage or disadvantage, economically, of these migrations of laborers.

SUGGESTIONS FOR THE STUDY OF LOCAL CONDITIONS

1. Density of population. 2. Emigration or immigration.
3. Household industries. 4. Factories. 5. Industrial centers.

SUGGESTIONS FOR REPORTS FROM REFERENCES, ESPECIALLY FROM COMMERCIAL GEOGRAPHIES

1. The concentration of industries in the United States and parallels in the Philippines. (Brigham, pages 92-110, 202-228; Bishop and Keller, 201-209.)

2. The United States, the United Kingdom, Germany, France, Belgium, Japan as manufacturing countries. (Brigham; Bishop and Keller.)

3. The production of cloth, hats, mats, pottery, and embroidery in the Philippine households. 4. Encouragement by the government. 5. The export of household manufactures from the Philippines. 6. The United States as a favorable market.

7. Philippine factories. 8. The growth of the Philippine export of manufactured and partly manufactured products.

9. The life-insurance companies in the Philippines as factors in stimulating the growth of capital through saving.

10. From the latest report of the Collector of Internal Revenue determine the income tax per capita in each province; the tax per capita on merchants and manufacturers. 11. Plot these figures and comment on them.

12. From figures in the annual report of the Treasurer of the Philippine Islands make a chart showing the increase in the commercial savings accounts since 1907. 13. Make a similar chart

showing the total resources of commercial banks since 1907. 14. Interpret this chart in terms of accumulated capital and of what you have learned about the history of the trade in export crops.

15. The financing of industry and the development of corporations. (Bishop and Keller.)

16. The corporation laws of the Philippine Islands. You have just organized a corporation which has entered into the business of manufacturing cigars. Explain how the organization was effected.

17. The production of coal and iron, and how manufacturing and industry in general depend on them (illustrated with charts, tables, and maps). (All commercial geographies.) 18. The importation of coal into the Philippines. 19. The importation of iron and steel, and their manufactures.

20. The commercial history of petroleum. 21. Its manufacture and uses. (All commercial geographies.) 22. Imports of petroleum and its products into the Philippines.

23. The production and use of gold, silver, copper, and platinum. (All commercial geographies.) 24. The production of gold in the Philippines (see the Treasurer's Annual Report).

25. The production and use of the principal metallic minerals. (Bishop and Keller and other commercial geographies.)

26. The production and use of the principal nonmetallic minerals. (Bishop and Keller and other commercial geographies.)

27. Textile manufacture. (Bishop and Keller and other commercial geographies.)

28. Chemicals and dyestuffs. (Bishop and Keller and other commercial geographies.)

29. Development in the uses of electricity. (Bishop and Keller and other commercial geographies.)

30. The making and use of cement. 31. Its particular value for construction in the Philippines. 32. Domestic production of cement.

33. The world's production and supply of salt. 34. Its production and trade in the Philippines.

35. Other uses of minerals. (All commercial geographies.)

36. Although statistics on household industries in the Philippines will not be available until the publication of the census of

1918, preliminary figures indicate the importance of these industries. Statistics from eight provinces are as follows :

PROVINCES	ESTABLISHMENTS	VALUE OF RAW MATERIALS	VALUE OF PRODUCTION
Batangas . . .	12,097	₱ 1,132,204.14	₱ 2,341,212.45
Cavite	2,440	207,278.02	585,027.02
Laguna	1,651	233,783.15	547,491.97
La Union	752	112,638.44	1,883,905.82
Leyte	5,302	487,470.07	1,498,215.34
Pampanga	3,425	340,672.89	1,028,994.45
Rizal	2,166	360,383.38	788,827.65
Sorsogon	959	112,637.80	293,093.53
Total	28,792	₱ 2,987,167.89	₱ 8,868,868.23

From these statistics compare the production of household industries per capita in the different provinces.

37. Compare the value of the product of the household industries with the values of various crops, as shown in the statistical reports of the Bureau of Agriculture.

38. If a copy of the census of the Philippine Islands for 1918 is available, make charts indicating the provinces in which household industries are of greatest importance.

39. Make a small map showing the distribution of household industries in the Philippines, using data on household industries by municipalities from the census of 1918, and letting each dot represent 100 workers or 10,000 pesos' worth of product.

MANUFACTURING IN THE PHILIPPINES (FROM THE CENSUS OF 1918)

1. From the data on population by provinces and municipalities in the census of 1918 make a small map showing the distribution of population in the Philippines. Let each dot represent 10,000 inhabitants. Compare this map with Chart XXXIV. 2. Make a chart of the provinces in the order of density of population. 3. Which provinces have areas of very dense and which of very sparse population ?

SELECTIONS ON THE THEORY OF ECONOMICS TO BE APPLIED
TO THE MATERIAL IN THE CHAPTER

1. The law of diminishing returns. (Bullock, pages 74-75.)
2. Review the references for the organization of labor. (Bullock, pages 304-316.)
3. The factors of production. (Bullock, pages 32-54.)
4. The organization of the factors of production. (Bullock, pages 55-60.)
5. Business corporations. (Bullock, pages 60-73.)
6. The law of economy in organization. (Bullock, pages 82-91.)
7. Monopolies. (Bullock, pages 169-197.)
8. Labor adjustments. (Bishop and Keller, pages 385-396.)
9. Explain the following quotation from Clay's "Economics for the General Reader": "The employer buys labor, not the laborer; if he can get a great deal of labor from one man, he may pay him as well and will probably pay him better than buying a little labor from each of two or three men."

CHAPTER XVIII

EXCHANGE

Just as a division of labor results in commerce between men, so commerce between regions arises from those different conditions of soil, climate, and environment which cause one locality to produce certain things cheaper and better than they can be produced elsewhere. Since each person produces but one commodity, he must exchange this for whatever he requires; since the inhabitants of a given place produce and export those commodities which they can obtain in greatest amounts, or which will bring them the greatest returns, they are obliged to import other products in exchange.¹ Commerce in the tropics consists of the export of raw materials to the northern temperate regions, and the import of manufactured goods from those regions.

¹ In the coconut region of Sariaya, in Tayabas Province, practically all food-stuffs and manufactured articles are imported, since it is more profitable for the people to give all their attention to their coconut groves than to branch out into other industries. Hence all available land is planted with coconuts. Abaca, sugar cane, tobacco, and the coconut palm flourish in the Philippines. Consequently hemp, tobacco, copra, and sugar are exported, while rice, cloth, machinery, flour, and other manufactured products are imported. So, in most localities, certain things which are not produced at all, or not so cheaply as in other regions, are imported and paid for with those products to which the locality is adapted.

Commerce also arises from the habits of people. National habits spring, for the most part, from environment which creates peculiar material wants. These habits are most apparent when people move to other lands. Thus, the Americans and northern Europeans have brought to the Philippines their taste for butter, and the people of southern Europe their taste for olive oil. Tea must be imported into the Philippines for the consumption of the Chinese and other tea drinkers. Trepang (a sea slug obtained in the Philippines) is not consumed by the Filipinos, but by the Chinese. The Filipinos use many fruits, such as papayas, in a green state, whereas Europeans and Americans consume them only when ripe.

TOTAL FOREIGN COMMERCE OF THE PHILIPPINES

On Chart XXXVI it will be seen that the total volume of foreign trade was fairly constant during the last years of the

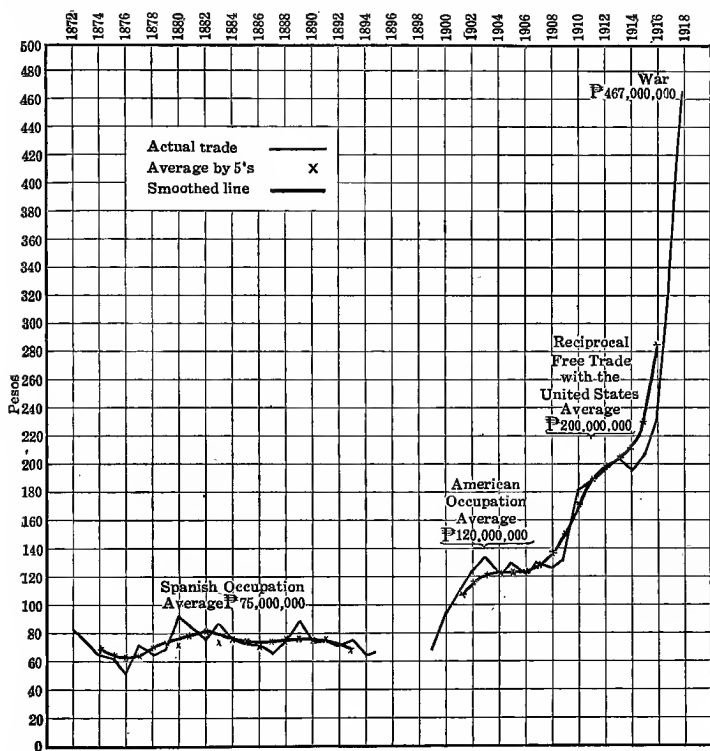


CHART XXXVI. TOTAL FOREIGN TRADE OF THE PHILIPPINE ISLANDS
IN MILLIONS OF PESOS

Census and Customs Statistics

Spanish occupation. For the twenty years from 1874 to 1894 the average total trade was about ₱75,000,000.

This stagnant condition was changed by the American occupation. The restrictions on internal and external trade were removed, and interest in the economic development of the

country was encouraged. By 1902 the foreign trade of the Philippines had increased to more than ₱120,000,000, a level which was maintained until 1909. In 1909 the Payne tariff provided for reciprocal free trade between the Philippines and the United States; this gave to the Philippines a practically unlimited market at prices much higher than could be secured in other countries of the world. The production of export crops rapidly extended; by 1913 the total trade of the Islands reached the level of more than ₱200,000,000.

The trade would probably have remained there had not the World War occurred. In 1916 the great demand for raw materials which this conflict caused finally affected the Islands. In the last two years of the war the volume of Philippine trade doubled; in 1918 it was more than ₱467,000,000.

An examination of the statistics covering the export of hemp, coconut products, sugar, and tobacco indicates that the larger part of the increased value of exports from 1910 to 1913 was due to increase in the actual amount of products sent out of the Philippines; the amount of goods imported also greatly increased. On the contrary, the increase in value of exports in 1917 to 1918 was mostly due to war prices; that is, the Philippines received much more for only a slightly greater volume of products, and had to pay higher prices for goods imported. In general, the increased value of trade in 1913 was due to the amount of goods, and in 1918 to the high price.

What will the post-war level of Philippine exports be? It will certainly be much higher than the level reached in 1913. The war demands have increased the acreage of Philippine export crops, and a considerable percentage of war profits have been invested in improvements to agricultural lands, and in machinery to aid in the manufacture of raw materials, as in sugar centrals and oil mills; the world level of prices has permanently increased, and higher prices may be expected for all Philippine products. World conditions indicate a permanent increasing demand for cane sugar, copra, and oil; and a market for Philippine cigars and tobacco has evidently been

firmly established in the United States. Of all the principal export crops of the Philippines hemp is the only one that does not seem to have an immediately bright future; it is probable that the slump in 1919 was merely a repetition of similar periods in the history of abaca. Although it is probable that the general level of exports will not be so high as in 1918, because of the abnormal war prices ruling at this time, nevertheless there are indications that the Philippines will enter a period of great prosperity and attain a volume of trade much higher than at any previous period. For the first six months of 1919 the value of exports from the Philippines had decreased about twenty-five per cent over the exports for the first six months of 1918; imports increased heavily, however, and as a consequence the total trade for the first half of 1919 was only a little less than that for the first half of 1918.

BALANCE OF TRADE

On Chart XXXVII both the imports and the exports of the Philippines from 1899 to 1918 are indicated. It will be noted that during certain periods imports have exceeded exports; and that during other periods exports have exceeded imports. In general, exports and imports seem to counterbalance each other in the foreign trade of the Philippines. Large importations of rice probably had something to do with excessive imports in the years from 1899 to 1904 and from 1910 to 1914. Imports would have been much greater in 1917 and 1918 if it had been possible to secure goods. With the end of the war a greater proportion of orders from the Philippines were filled in the United States and Great Britain; in the first six months of the year 1919 imports had again exceeded the exports.

In 1912 Philippine imports were ₱123,000,000, and exports about ₱110,000,000, a difference of about ₱13,000,000. In 1916 the difference was ₱49,000,000, but this was an excess of exports over imports, the exports for the year having been ₱140,000,000, and the imports about ₱91,000,000. Such a

difference between imports and exports is called the balance of trade, the significance of which is usually misunderstood.

Two centuries ago the mercantilist theorists supposed that an excess of exports was favorable to a country and an excess of imports unfavorable. Such, however, is not the case, since other factors influence the balance sheet of the country:¹

Items tending to excess imports

1. Imports
2. Receipt of a loan
3. Interest on capital invested in other countries
4. Earnings of native merchants abroad
5. Donations received
6. Profits of shipping
7. Expenditures of other nations
8. Indemnities received
9. Travelers from other countries

Items tending to excess exports

1. Exports
2. Repayment or an advance of a loan
3. Payment of interest on foreign capital
4. Profits of foreign merchants
5. Donations given
6. Payments to foreign shipping
7. Expenditures made abroad
8. Indemnities paid
9. Travelers in other countries²

In the long run the balance of trade of the Philippines should be favorable. Excess exports should be sent away to pay (1) interest on large sums of foreign capital invested here, (2) profits of foreign merchants who control the trade of the Islands, (3) charges for the use of foreign shipping, (4) money taken or sent away, (5) expenditures of travelers and students abroad.

¹ That both rich and poor countries may have an unfavorable balance of trade or a favorable balance may be seen from the following pre-war figures:

	IMPORTS	EXPORTS
Austria-Hungary	\$ 641,576,000	\$ 483,773,000
Belgium	832,406,000	682,418,000
Canada	521,448,000	290,224,000
China	306,812,000	245,538,000
United Kingdom	3,309,987,000	2,204,322,000
Brazil	256,942,000	325,271,000
British Indies	449,583,000	719,334,000
United States	1,653,265,000	2,170,320,000

² Bastable's "The Theory of International Trade."

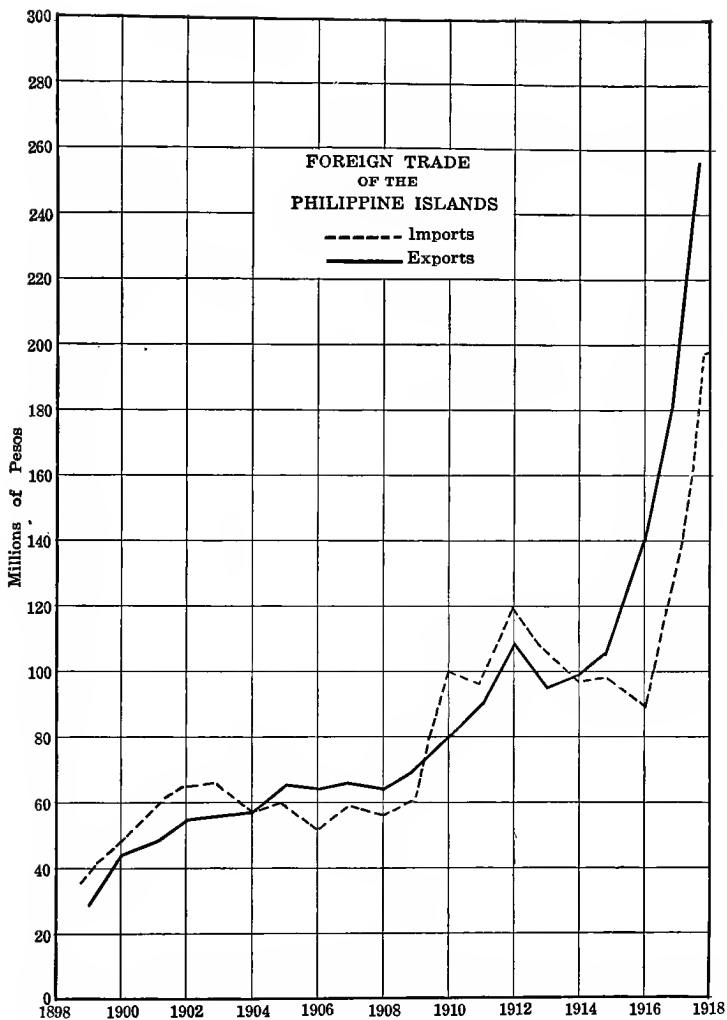


CHART XXXVII. FOREIGN TRADE OF THE PHILIPPINE ISLANDS IN
MILLIONS OF PESOS

Census and Customs Statistics

On the other hand, the expenditures of the United States government for supplies for its troops and vessels stationed

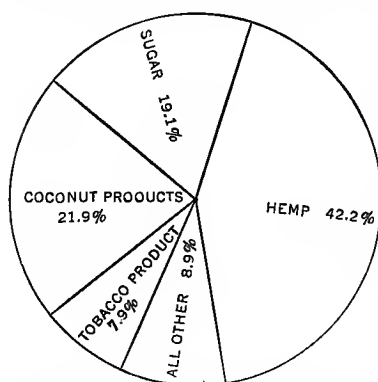


CHART XXXVIII. ARTICLES INCLUDED
IN THE PHILIPPINE EXPORT TRADE
Averages of ten years in percentages

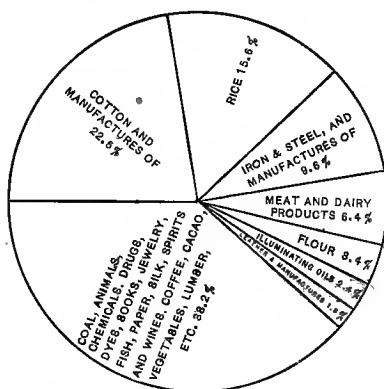


CHART XXXIX. ARTICLES INCLUDED
IN THE PHILIPPINE IMPORT TRADE
Averages of ten years in percentages

here, and for the payment of these troops, tend to reduce the excess of exports, while the inflow of foreign capital still more greatly increases the imports, and even results in an unfavorable balance. This may continue for some time.

That a rich country like the United Kingdom should have an unfavorable balance of trade, and a poor country like India a favorable balance of trade, shows that these words are misnomers when so employed. Excess imports and excess exports are the results of complex conditions, and either of them may indicate a healthy condition of a country's foreign commerce.

PHILIPPINE TRADE WITH THE UNITED STATES

The character of exports from the Philippines may be seen in Chart XXXVIII. The proportion of each of the four principal exports

in the export trade from year to year is indicated in Chart XI. In Chart XXXIX may be seen the character of the average imports.

Chart XL indicates that the imports from the United States have greatly increased in importance since 1909. Before that time, and from the beginning of the American occupation, the imports into the Philippines came for the most part from Great Britain and the United States, and to a less extent from Germany and France. (This discussion does not include

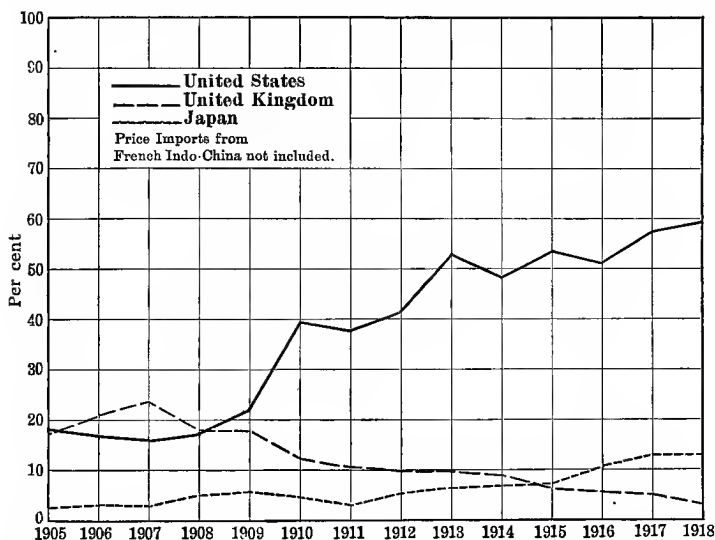


CHART XL. COUNTRIES PARTICIPATING IN THE IMPORT TRADE INTO THE PHILIPPINE ISLANDS IN PER CENT OF TOTAL IMPORTS

Customs Statistics

the import of rice from French Indo-China.) Until 1909 Great Britain had been the source of about twenty per cent of the imports into the Philippines; the United States controlled somewhat less than that proportion. In 1909 the Payne tariff made it cheaper to import certain classes of goods from the United States, for these paid no duties; consequently the proportion of imports from the United States greatly increased. By 1913 the share of the United States in the import trade into the Philippines was fifty per cent. It would probably

have remained at those figures if the World War had not made the Philippines dependent on America for many articles which would normally have been procured in Europe. In 1918 this had increased to almost sixty per cent.

Between 1909 and 1913 the percentage of imports from the United States trebled. In the same period the value of these imports increased more than fivefold, that is, from ₱10,000,000 to more than ₱50,000,000. This happened because the import trade of the Islands increased very greatly during the period in question, and nearly all of the increase came from the United States. Many products, such as automobiles, had never before been imported in quantity; other products that had previously been imported from the countries of Europe, such as cotton goods and iron and steel products from Great Britain, sardines from Spain, dyes, medicines, and chemicals from Germany, jewelry, watches, and fine goods from France, were now obtained from America. In the period from 1915 to 1918 about seventy per cent of cotton goods and an average of eighty-five per cent of iron and steel products were imported from the United States. These are the two largest items in the import trade, as will be seen in Chart XXXIX. The importance of the trade of the Philippines with the United States can be determined from the table on page 401, which shows the exports of the United States to the principal countries in the years 1918 and 1919.

Just as the United States has found a most excellent market for its goods in the Philippines, so have the Islands disposed of their products to the United States. In Chart XLI it will be seen that in 1918 sixty-five per cent of the value of the export trade from the Philippines went to the United States. In 1914 the percentage was fifty per cent; in 1908, before the Payne tariff became effective, it was about thirty per cent. The value of the United States market to the Philippines is even better illustrated in Chart XLIII, which takes into account the great increase in the value of exports from the Philippines. From 1908 to 1914 the increase was from

EXPORTED	DURING THE YEAR ENDING JUNE, 1919	DURING THE YEAR ENDING JUNE, 1918
To Europe		
Austria-Hungary	\$19,441,603	
Belgium	322,940,837	\$95,390,695
Denmark	93,167,530	4,969,542
France	976,696,797	883,734,921
Germany	8,843,882	
Greece	22,908,250	2,573,882
Italy	496,174,736	477,898,774
Netherlands	103,801,757	6,381,964
Norway	101,641,460	25,216,242
Russia in Europe	11,390,318	116,705,346
Spain	98,931,638	67,163,288
Sweden	78,119,187	4,122,550
United Kingdom	2,147,412,241	1,995,863,297
Total amount for exports to Europe	\$4,481,470,236	\$3,670,020,501
To North America		
Canada	813,723,031	778,490,022
Central America	48,131,130	43,582,982
Mexico	119,962,982	107,077,033
Cuba	229,545,706	235,469,608
Total amount for exports to North America	\$1,211,362,849	\$1,164,619,645
To South America		
Argentina	138,831,832	109,373,150
Brazil	93,294,275	66,270,046
Chile	70,288,581	63,529,124
Total amount for exports to South America	\$302,414,688	\$139,172,320
To Asia		
China	82,992,495	43,476,623
British East Indies	64,272,887	52,292,943
Japan	326,462,268	267,641,212
Russia in Asia	41,455,457	34,718,541
Total amount for exports to Asia	\$515,185,107	\$398,129,319
To Oceania		
Australia and New Zealand	1,37,034,154	83,960,179
Philippine Islands	69,930,876	48,425,083
Total amount for exports to Oceania	\$206,965,030	\$132,385,267
To Africa		
British Africa	55,344,450	44,747,874
Total amount for exports to Africa	\$55,344,450	\$44,747,874
Total amount for exports to all countries	\$6,772,742,360	\$5,549,074,926

about ₱20,000,000 to about ₱50,000,000. But in 1918 the exports from the Philippines to the United States were almost ₱180,000,000, being an increase of ninefold. All of the four chief exports from the Philippines entered into this increase of exportations. More hemp goes direct to the United States than via London, and the value of the hemp sent to

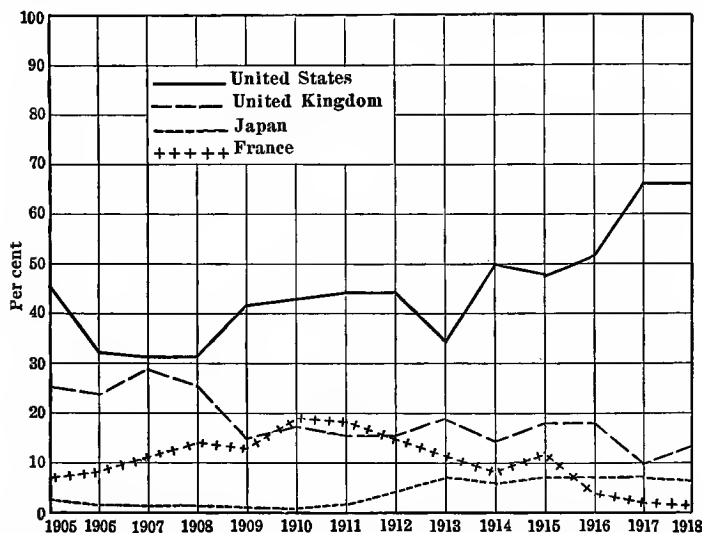


CHART XLI. COUNTRIES PARTICIPATING IN THE EXPORT TRADE FROM THE PHILIPPINES IN PER CENT OF TOTAL EXPORTS

Customs Statistics

the United States is much greater than that sent to England. The product of the numerous sugar centrals and cigar factories, established in the Philippines since 1909, is practically all sent to the United States. During the World War the United States absorbed almost the entire export of Philippine copra, and the product of the new Philippine coconut-oil industry. In addition, the market furnished by the United States is responsible for the large exports of embroidery, hats, and lumber.

The growth of trade between the United States and the Philippines is shown on Chart XLIV. It will be noted that before the present tariff relations became effective, exports to the United States exceeded imports from that country. Before the World War they were practically equal. This exchange of goods is beneficial to both countries, as a study of the export figures will show. The United States is a large importer of tropical raw products for manufacture, and an exporter of manufactured goods suitable for use in the tropics. The Philippines supply many of these raw materials, and demand the manufactured products. Of the exports from the Philippines to the United States almost seventy-five per cent were raw or partly manufactured, and of the twenty-five per cent ready for consumption a large part were products of handicrafts which cannot be produced in the United States. Of imports from the United States about ninety per cent were manufactures and food products ready for consumption, and about ten per cent were raw and partly manufactured products.

The Philippines and the United States are reciprocal producers and consumers. The rapidly increasing trade between them is strengthened by the mutual elimination of trade barriers (tariffs).

PHILIPPINE TRADE WITH COUNTRIES OTHER THAN THE UNITED STATES

Since 1909 the percentage of nearly all other countries in the Philippine trade has been decreasing. This is particularly true of the United Kingdom, as shown on Charts XL and XLI. The value of imports into the Philippines from the United Kingdom continued about stationary until the beginning of the war, after which it declined, on account of the lack of goods in the United Kingdom, and the lack of transportation facilities. The amount of goods exported to the United Kingdom remained about the same, the increase from 1915 to 1918, noted on Chart XLIII, being almost entirely due to the high prices.

Before the war Japan's trade with the Philippines had increased very greatly, especially with respect to imports into the Islands. During the war the manufacturing industries in Japan were greatly benefited, because competition with the countries of Europe practically ceased. It is natural

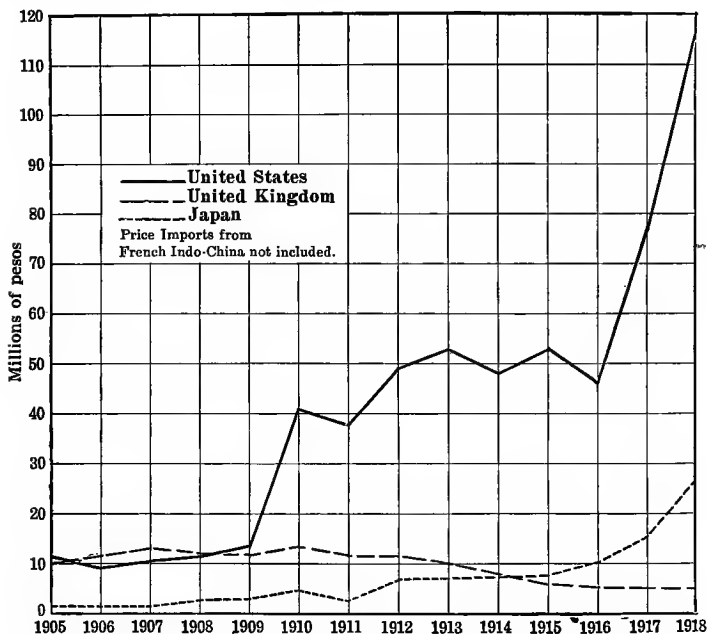


CHART XLII. COUNTRIES PARTICIPATING IN THE IMPORT TRADE

Customs Statistics

that the imports from Japan into the Philippines should increase, since Japan is so close, but it is questionable whether the rising line of importations noted on Chart XLII can be maintained by Japan after exportations again begin from Great Britain, France, and Germany. The increase in the exportations to Japan noted on Charts XLI and XLIII were almost entirely due to the abaca-braid industry, which

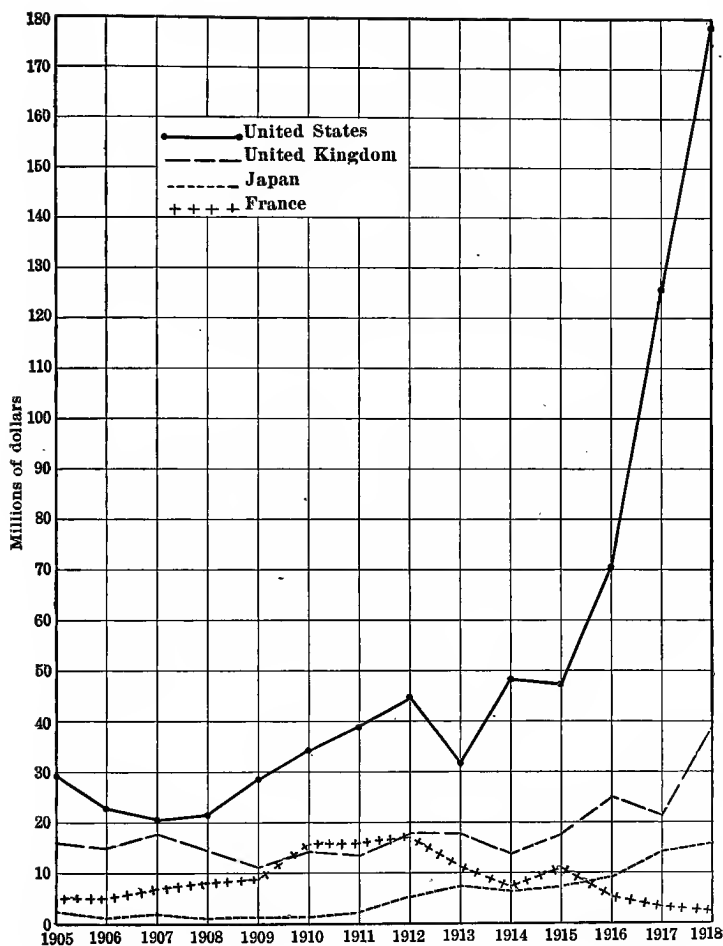


CHART XLIII. COUNTRIES PARTICIPATING IN THE EXPORT TRADE
Customs Reports

attained a large growth in the years 1912 and 1913 in Japan; the raw material for this industry came from the Philippines.

France has never imported largely into the Islands, but has been a heavy buyer of Philippine copra and to a less extent

of Philippine tobacco. The line on Charts XLI and XLIII representing exports to France for the most part represents copra. The decrease in this trade is a war condition. Whether the line will again rise when conditions in Europe become normal is a question of great moment to the Philippine oil mills. The question arises, Will the copra trade to France be resumed? If it is resumed, the copra thus diverted from the Philippines will necessitate the closing down of a number of coconut-oil mills in the Islands.

In addition to the trade noted above, the Philippines normally import a quantity of foodstuffs, especially flour, meat, and dairy products from Australia. Food products are also brought in from China, especially fish, fruits, eggs, and vermicelli and macaroni. The import trade from other countries, especially countries in Europe, is small.

In addition to the countries already mentioned, the Philippines export in normal years a considerable quantity of tobacco to Spain, and a good deal of sugar to China. Our exports to other countries are small, consisting for the most part of the four staple export crops either in raw or partially manufactured state, such as knotted hemp to Italy, and cigars and cigarettes throughout the Orient and to Europe.

DOMESTIC COMMERCE OF THE PHILIPPINES

The amount of a country's domestic commerce depends on the territorial extent of the country, especially from north to south, the consequent different conditions of climate and soil, and the number of different products raised. The United States has so great a diversity of production because of its extent that it could be self-supporting if necessary.

The domestic commerce of the Philippines is limited, because there is little diversity of production for domestic consumption. Only a few regions raise crops for export to other parts of the Islands. Such are the orange regions of Batangas, the tobacco district of the Cagayan, and parts of the rice region of the Central Plain of Luzon. In a few places household

articles are manufactured for domestic trade, such as the cotton cloths of the Ilocanos, the hats of Mavitac and Cavinti, in Laguna Province, and sleeping mats from several towns. However, most regions of the Philippines are self-sufficing or produce crops for export from the Islands; hence domestic trade for the most part consists of moving the export crops to the ports and distributing imports. In districts where farming is done for subsistence, as in Ilocos Norte, the amount of imported goods consumed by a family is small indeed. The Ilocano agriculturist is not a commercial farmer; he produces just enough rice, corn, beans, chickens, and hogs for his own needs; he raises enough sugar to supply himself with basi, and enough cotton to clothe his family. On the other hand, in a region devoted to export crops almost everything consumed may be imported.

Internal Revenue licenses and domestic money orders are measures of internal prosperity. The following tables show that Internal Revenue licenses issued in 1917 were more than twice as numerous as those issued in 1919; the amount of domestic money orders almost trebled during the same period, and increased more than sixfold from 1906 to 1917:

YEAR	MONEY ORDERS ISSUED PAYABLE IN THE PHILIPPINE ISLANDS	
	Number	Amount
1906	94,261	P3,687,126.81
1907	98,813	3,229,446.09
1908	107,751	3,645,123.13
1909	126,148	8,017,355.96
1910	151,357	9,781,670.48
1911	191,614	12,265,166.15
1912	160,524	11,184,401.70
1913	200,653	12,848,999.08
1914	254,880	14,880,007.02
1915	285,057	15,453,467.04
1916	334,066	16,996,113.80
1917	381,874	22,487,134.52

TRANSPORTATION¹

Inland transportation in the Philippines is carried on over trails and roads, and by water and railroads. Trails are found in the less developed parts of the Islands, particularly in the mountainous regions. Human beings are employed as porters (cargadores) to a great extent; horses and carabaos are also

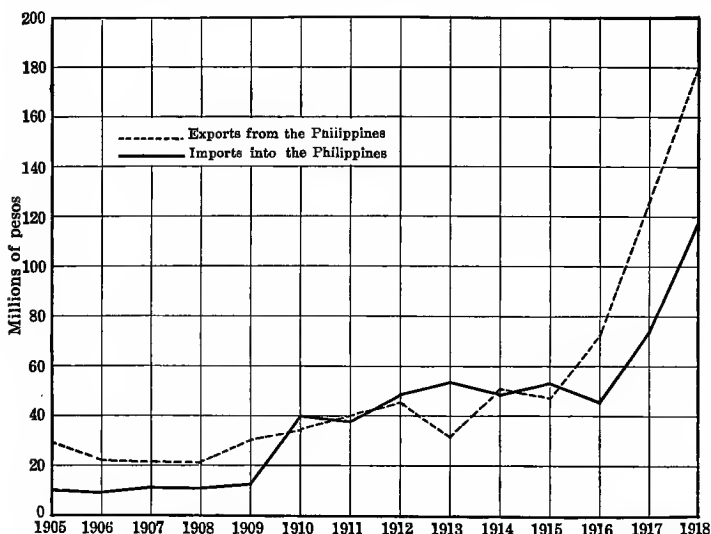


CHART XLIV. TRADE WITH THE UNITED STATES

Customs Statistics

used. Such transportation is expensive, and the amount of product that can be carried is limited. The building and maintenance of good roads account in no small measure

¹ To be efficient, transportation must be cheap, reliable, and rapid. Transportation must be cheap, or goods cannot always be sold in their proper market. Thus in the year 1910 a large part of the orange crop in Batangas could not be brought to market on account of the bad roads from Tanauan to the railroad. The cost of transportation over the road was so great that the price received for the oranges would not have repaid the farmer. Transportation must be reliable in delivering the goods both in good condition and

INTERNAL REVENUE LICENSES ISSUED FROM 1909 TO 1917, INCLUSIVE

[Source: Bureau of Internal Revenue]

NATURE OF BUSINESS	NUMBER OF LICENSES ISSUED									
	1909 ¹	1910	1911	1912	1913	1914	1915	1916	1917	
Brewers	1	1	1	201	6	15	15	15	20	
Chiropodists, manicurists, tattooers, etc.						191	75	100	93	
Common carriers, etc.	415	201	701	1,472	2,028	3,163	18,095	9,954	9,594	
Contractors, warehousemen, etc.						1,026	5,094	6,838	7,620	
Customs and immigration brokers	37	24	31	23	20	21	25	30	29	
Distillers	78	69	62	70	62	73	72	71	88	
Lawyers, medical practitioners, etc.	1,975	1,944	2,097	1,558	1,717	1,430	1,308	1,338	1,521	
Manufacturers of and wholesale dealers in motor spirits, mineral oils, etc.							145	7	5	
Manufacturers of cigars and cigarettes	263	124	105	106	81	83	77	77	173	
Manufacturers and manufacturers	60,815	64,945	74,037	89,147	95,567	80,911	72,525	70,858	79,691	
Merchants and manufacturers						277	509	358	429	
Midwives, cirujanos ministrantes, etc.						184	259	208	163	
Money lenders						81	85	78	66	
Pawnbrokers	64	65	70	65	83			173	195	
Pearl fishing						19,498	34,528	37,506	41,904	
Peddlers of merchandise						422	660	979	1,118	
Pharmacists, farriers, and opticians			253	283	324	203	409	417	488	
Photographers, lithographers, etc.	189	183				155	147	135	135	
Printers and publishers						330	596	591	731	
Procuradores judiciales, agentes de negocios, etc.						239	380	412	352	
Real-estate and merchandise brokers	174	179	179	184	358	29	29	35	28	
Rectifiers	49	40	32	26	24					
Registered dealers in prohibited drugs	1,262	1,315	1,375	1,261	1,236	1,242	1,445	1,032	1,170	
Retail dealers in fermented liquors				9,871	19,482	24,770	28,286	33,960	36,508	
Retail dealers in tuba, basi, and tapuy							7,174	8,683	11,055	
Retail dealers of leaf tobacco							29	32	28	
Retail liquor dealers	1,270	1,370	1,272	900	921	861	828	873	916	
Retail peddlers of alcoholic and tobacco products	1,055	774	782	662	1,338	1,959	750	794	1,332	
Retail "vino" dealers	21,094	21,728	23,585	25,091	25,717	22,862	19,917	20,993	30,966	
Signs, signboards, and billboards						430	915	719	904	
Sponge fishing								1	43	
Stockbrokers	73	145	218	207	220	103	98	107	110	
Tobacco dealers	27,815	28,976	29,721	31,758	33,200	32,482	30,061	31,466	37,083	
Tobacco manufacturers.	155	80	67	43	68	58	67	86	81	
Veterinarians	408	440	472	523	599	355	249	19	8	
Wholesale dealers in fermented liquors	169	134	143	596	337	309	302	298	342	
Wholesale liquor dealers	509	538	553	705	792	810	768	862	1,176	
Wholesale peddlers of alcoholic and tobacco products							74	105	145	
Miscellaneous	4,527	4,104	4,468	4,970	4,936	6,043	6,910	6,478	7,364	
Total	122,397	127,379	140,224	169,722	189,116	200,500	234,461	238,444	276,008	

¹ No data available prior to 1909.

² See "Retail peddlers of alcoholic and tobacco products."

for the recent economic development of the Philippines. The increase in first-class roads can be determined from the following table, which gives the kilometerage:

1908	395.0 km.
1912	1780.3 km.
1915	more than 3000.0 km.
1918	more than 4000.0 km.

In addition there were in 1917 some 2000 kilometers of second-class and 3000 kilometers of third-class roads. Sleds and carts with narrow, tired wheels are disappearing. Carts drawn by carabaos or cattle are used for heavy roads, and caratellas pulled by horses for light loads and passengers. Automobiles are being employed to an increasing extent; on good roads they effect a saving in both cost and time.

The cost of transporting 100 kilos for one kilometer by these various means was estimated by J. C. Scott, Head Teacher, Masbate, as follows:

Over good roads

By cargadores	₱0.50
By carabao back	0.15
By carts	0.04

Over bad roads

By cargadores	₱0.60
By carabao back	0.17
By carts	0.17
By sleds	0.15

with promptness. Much merchandise is lost in the Yangtze-kiang through the Ichang gorges, because boats must pass over dangerous rapids, and several are overturned each year. If merchants are expecting goods on a certain date, they may lose a considerable amount of money if the goods arrive late. In the case of perishable goods, such as fruits and vegetables, transportation must be rapid. The rice crisis of 1919 was largely due to the breakdown of transportation from the Central Plain of Luzon; the direct cause was the extraordinary floods of that year. Rice stocks could not be moved to Manila for distribution to the provinces in which there was a shortage.

Transportation over a poor road in the rainy season may cost five times as much as in the dry season. Everywhere excellent examples are available of the reduction in the cost of transportation by the building of good roads. In many cases the new rate is only a half or even a fifth of the former tariff.¹

The construction of a railroad into a community nearly always results in an industrial awakening. This has been seen



CARTS ON A FIRST-CLASS ROAD

in many parts of the Islands which have been recently connected with a market by a railroad. There are now in the Philippines 1,225.85 kilometers of railroads, of which 1,013.85 kilometers are in Luzon, 95.6 kilometers in Cebu, and 116.4 kilometers in Panay. One fourth of the people are reached by railroads. Ownership of railroads is an important consideration in all countries. If a community is connected with its

¹ Products have a fixed price in the market ; hence, if the localities where the products are made are connected with the market by poor means of transportation, the cost of the articles imported will be correspondingly high. A region having good facilities for transportation can send its products to the market at little cost, but one which has poor facilities must pay extra for carriage. Thus, if the market price of a certain grade of abaca fiber is ten pesos per piko, a town which has good transportation facilities pays one peso

market by a railroad which is poorly managed, or which charges high rates, the community will suffer. In Europe railroads are owned for the most part by the respective governments. In the United States and many other new countries the railroads are owned by private capital (corporations), although the government attempts to exercise a control over them to prevent discrimination in prices against certain communities. In the Philippines the railroads of Luzon are owned by the government; arrangements have been made to bring eventually most of the mileage of Cebu and Panay also into the possession of the government. The new railroads are not only opening up regions which were backward on account of the conditions of transportation, but are also offering quick and cheap means of travel, so that the people of these regions are becoming less provincial and more progressive, and labor is becoming more mobile. The Filipinos have shown also that they enjoy travel.

The cheapest form of transportation, although not the quickest, is by water. Waterways require much less labor and less power to propel a given weight than do roads or railroads. Most Philippine products intended for domestic consumption are carried to market in dugouts, lighters, launches, and small sailboats. Much of the abaca fiber, copra, sugar, and tobacco is brought to the ports of entry by these carriers.

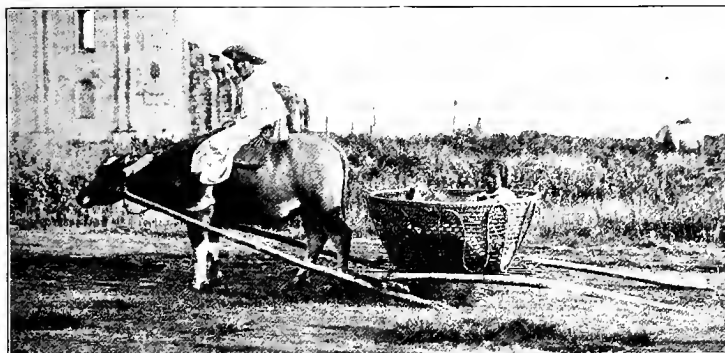
In archipelagoes, such as the Philippines, interisland communication is of great importance. Ocean vessels load and unload at the ports of entry. Smaller interisland steamers, sailing vessels, and other minor craft take the goods from

per pico to get its products there, while another locality connected by poor roads will perhaps pay five pesos per pico. The gross return in the first case will be nine pesos, and in the second case only five pesos per pico, and abaca will have a higher price in the first locality.

Therefore, poor means of transportation increase the price of imports and decrease the price of exports, and good means of transportation decrease the price of imports and increase the price of exports. As has been shown, the export of abaca fiber from mountain regions ceases when the market price falls, since the cost of transportation is not covered.



A PACK TRAIN FROM THE HIGHLANDS



A BAMBOO SLED



A PRIMITIVE CART

PHILIPPINE TRANSPORTATION

these principal points and distribute them throughout the Islands; at the same time they take on board the produce from the minor ports to bring it to the ports of entry for export. Such communication by water needs only good roads and railroads connecting the shore towns with the inland parts of the Islands to make an excellent transportation system.

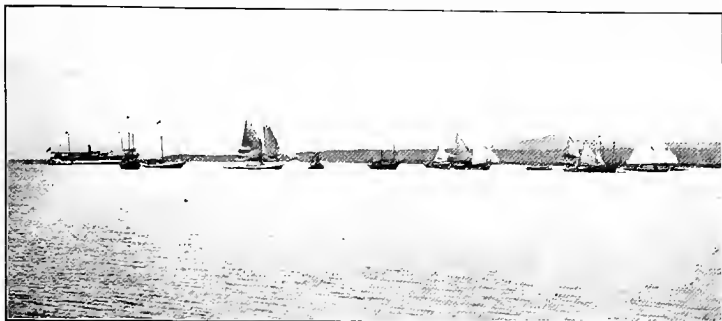


AUTO TRUCKS IN MANILA

TRANSPORTATION CENTERS AND MARKETS

Communities grow where there are favorable agricultural and manufacturing conditions. They also exist where products can be easily gathered and distributed. Thus Manila is a center of transportation, or center of commerce, where the products of the Philippines are gathered for export, and where imported goods are brought for distribution throughout the Islands. It is the natural outlet for the products of the Central Plain of Luzon and the region of Laguna de Bay, and a transshipment point for interisland trade of the Archipelago as a whole. Cebu is the port for the eastern Visayas (for abaca and copra) and Iloilo for the western (for sugar). Hongkong

is a distributing and gathering point of northern Asia both by way of the Suez Canal and the Pacific Ocean to the western



SHIPS ALONG A PHILIPPINE COAST

coast of America. Part of the foreign commerce of Manila, Cebu, and Iloilo goes through Hongkong; several steamers



A DOCK AT MANILA

are regularly engaged in carrying goods between these points. The importance of this transshipment trade has decreased with the establishment of more direct sailings from Philippine ports

to Europe and the United States. Singapore is an important center of transportation of southern Asia, whence the goods from Europe and the eastern part of the United States coming through the Suez Canal are distributed, and where products are picked up to be sent to Europe and America. The Philippines receive some goods shipped via Singapore; they send some of their copra and much rattan, resins, pearl shells, and the like for shipment through Suez. Zamboanga, the center of transportation of the Moro Province, is in direct communication with Singapore. Plans are under way to make Manila the center of transportation for the trade of the United States with the tropical Orient. The raw products of the East Indies, Malay Peninsula, and India will be brought to Manila and shipped direct to San Francisco. Manila will also be a distributing point for manufactures of the United States destined for these regions. Thus Manila will bear the same relation to foreign commerce of the neighboring Oriental countries that she now bears to the provincial trade of the Philippines.

Important centers of transportation for interisland commerce in export products are as follows:

Aparri and Lalloc for Cagayan Valley	Tobacco
San Pablo, Laguna Province	Copra
Lucena, Tayabas Province	Copra
Daet and Naga, Camarines Province	Abaca and copra
Legaspi, Albay Province	Abaca and copra
Gubat and Sorsogon, Sorsogon Province	Abaca and copra
Capiz and New Washington, Capiz Province	Abaca and copra
Romblon, Romblon Province	Copra
Calbayog, Catbalogan, and Borongan, Samar Province	Abaca and copra
Carigara, Palompon, and Baybay, Leyte Province	Abaca
Dumaguete, Oriental Negros Province	Abaca and copra
Cagayan, Misamis Province	Abaca and copra

The following are important market towns for the gathering and wide distribution of products in the domestic trade:

Candon and Vigan, Ilocos Sur.	General market for large district
San Fernando, Union Province.	General market for large district
San Fernando and Guagua, Pampanga . . .	General markets
Dagupan, Pangasinan	General market for province
Gapan, Nueva Ecija	General market for province
Calumpit, Bulacan	General market for province
Baliuag, Bulacan	General market for rice, hats, etc.
Pasig, Rizal	General market for province
Indang, Cavite	General market for highlands
Bauan, Batangas	General market for province
Pagsanjan, Laguna	Coconuts, oil, areca nuts, fruits, hats, etc.
Ormoc, Leyte	Grain
Carcar, Cebu	Corn, eggs, fruit, etc.
Oton, Iloilo	General market for southern Panay
Jaro, Iloilo	General market for northern Iloilo
Calivo, Capiz	General market for Aclan Valley

In addition there are many other market towns on which a smaller region is dependent for interchange of products.

Markets are not continuous, but are held at stated intervals, once or twice a week, for a period of from one to three days. The country people flock to these markets with their surplus products to sell or exchange, and merchants likewise come to buy, sell, or exchange. The centers of transportation and the markets are usually one of the following points: (1) the center of a rich agricultural district; (2) the head of navigation on a river; (3) the crossing or junction of railroads, rivers, and other means of transportation; (4) places where goods must be transshipped, as from small to large vessels, or from land to water transportation, and vice versa; (5) a good harbor; (6) places where festivals are observed.

MARKETS AND MERCHANTS

In primitive communication the exchange of goods between producers is effected at fairs or markets. Such commercial gatherings are found in all countries of the world. In the Philippines exchange occurs in the larger markets noted above,

but more particularly in the small local markets found in most of the municipal centers and in many barrios. The poorest of these display only small quantities of rice, corn, vegetables, and sometimes meat. The largest contain meat (pork and beef), fish, vegetables, minor household necessities, domestic and imported cloths, chickens, eggs, bread, kerosene, rice, corn,



OUTSIDE A PHILIPPINE MARKET

pottery, cutlery, hats, mats, native sugar, tobacco, rope, fruits, salt, beverages (tuba and vino), and canned goods (salmon, sardines, milk, beef, fruits).¹

In such markets producers often dispose of their articles directly to consumers for money or in trade. In general, however, the domestic as well as the export products of the Philippines are exchanged through merchants.²

¹ These markets have received special attention to improve their sanitary condition. Many municipalities have built new sanitary markets, which will greatly assist in making more healthful conditions in the Islands.

² The business of the merchant is to gather the products of different persons and places, and to distribute them to the consumer. The merchant stands

The domestic commerce of the Philippines is mostly in the hands of Chinese merchants; the foreign trade is controlled almost entirely by Europeans, Americans, or Chinese. The wandering traders are usually Filipinos, who deal in domestic products, although a relatively few are Chinese, East Indians, Syrians, and Japanese, who deal in foreign wares. The Filipinos keep the smaller tiendas and market stalls. They are the buyers of hats, embroidery, and other household products for export, and usually those for domestic consumption. The Chinese are large importers and wholesale merchants in the ports of entry, keepers of small stores in all parts of the Islands, and owners of interisland steamers. By purchase, barter, and extension of credit they obtain most of the abaca, copra, sugar, and tobacco from small producers and sell to other middlemen or to export houses. They also trade in rice and corn in the

between the producer and the consumer. Through the intervention of the middleman the producer is able to concentrate his effort on production.

The process by which Philippine hats reach the consumer in Europe and America will illustrate the system of marketing through merchants. In Lucban the brokers and wholesalers go from house to house buying hats, or they purchase the hats brought to them by the weavers in their employ. In Baliuag many hats are sold in the market, which occurs twice a week, and to which the weavers bring their products for disposal. The hats so gathered by the merchants are bought by exporters in Manila, and sent to import merchants in Europe and the United States, where they are again sold to factories or wholesalers, who in turn dispose of them directly or indirectly to retail stores. Thus they finally reach the consumer. During the rice investigation in 1919 it developed that there were in Manila some forty wholesale rice merchants who secured their supplies from the provinces or locally in large quantities. These supplies were sold usually on credit to about a hundred middlemen, jobbers, or brokers in rice, who in turn disposed of the rice, sometimes for cash but more often for credit, to about a thousand retailers, who again disposed of it to the public direct, sometimes for cash, more often on credit. Thus the rice was distributed from its source, the wholesaler, down through the different middlemen to the final consumer. It will be noted that credit was also distributed in like manner, the one link in this chain of exchange being dependent on the other. For instance, if the retailer had suddenly been suppressed, rice could not have reached the consumer, because the broker and the jobber would have been unable to reach the consumer, and, not knowing him, would not have been able to grant credit. In the same way, if the middleman, jobber, and broker had been suppressed, the wholesaler would not have been able to reach the retailer.

districts in which these are raised in surplus. Occasionally they deal in household products for domestic consumption, especially hats. Often their stores are merely run in connection with their buying activities, as convenient places to attract farmers with products for exchange or sale. It is noticeable that the Chinese merchants predominate in the Visayas and the Bicol Peninsula. They control most of the trade in Nueva Ecija, the Ilocano provinces, and the Cagayan Valley. In many parts of the Tagalog provinces natives control the largest part of the commerce. In a few places there are no Chinese. Taal-Lemery, in Batangas, is the most noteworthy of these.¹

¹ With the possible exception of Manila, Taal is the oldest known settlement of the Tagalogs. Pressure of population in the middle of the nineteenth century forced many of the people to emigrate to other provinces and islands; the same causes have developed small manufactures and commerce. Taal and Lemery constitute one community; after considerable losses by emigration they still have about forty thousand people. In area these towns are small, and have no large barrios, so that the bulk of the population is gathered at the mouth of the Pancipit River. This tends to a larger proportion of educated and ambitious families. The people of Taal are industrious and thrifty, and have an instinct for trade. It is impossible to say whence these qualities were derived, whether they came from Chinese ancestors, from competition with the Chinese, or from the keen struggle for existence in Taal. Probably the last is the case. The Taaleños are noted for a certain hostility to strangers. This includes not only Americans and Chinese, but also Filipinos of other towns. The list of permanent merchants in 1911-1912 shows a hundred and ten firms or individuals. Some of the partnerships consist of as many as ten persons. About three hundred persons are known to be connected with mercantile concerns which have a total capital of ₱190,000, an average of ₱1727 to the firm. The smallest capital employed is ₱500, and the largest ₱20,000. The total yearly purchases of these hundred and ten traders amount to ₱270,940; the yearly sales, to ₱343,780. The difference presumably represents the gross profit. Transportation charges will probably reduce this by twenty-five per cent. Fourteen of these firms operate tiendas in other towns of Batangas and other provinces. Seventeen others of these traders have tiendas in Taal.

Trade in Taal is favorable for democracy. The social position of a merchant there is unquestioned. The merchant class controls the social and political activities of the town. Some of these merchants can speak no language but Tagalog, and are anything but educated men; nevertheless, since the American occupation they have grown rich enough to buy and sell the old landed aristocracy. The most notable example of business success here is the owner of the fleet of steamers. Twenty years ago he was a servant in the house of a family in Lemery; he now has about a dozen vessels plying

The causes which contribute to the success of the Chinese as merchants in the Philippines are varied and intricate. These people have proved themselves natural traders in all parts of the world. They are apparently able to please their customers in the Philippines. They are content with a small profit, are thrifty, and accumulate capital. When the Spaniards landed in the Philippines, the Chinese were already engaged in trade here and rapidly availed themselves of the opportunity brought by the newcomers to exchange the silks and finery of China for the silver of Mexico. Soon they established themselves in the domestic trade under the protection of the Spaniards. In spite of periods of persecution and exclusion from the country they have built up a large commercial organization consisting of importers, wholesalers, middlemen, retailers, and buyers, and a credit system extending through all of these. Thus the Chinese storekeepers can offer credit where the Filipinos cannot. In their commercial efforts the Chinese have had little competition from the Filipinos, who not only have lacked business initiative and ability, and have not the saving instinct, nor the capital, but have had their entire means invested in agriculture, and have wished for too large profit. Filipinos of all classes are now evincing greater interest in commerce and industry. In many places their private commercial ventures are succeeding, and the number of Filipinos forming commercial corporations is constantly increasing. In certain towns (as in the highland region of Laguna) the idea of turnuhan appears in coöperative organizations of natives in retail stores and in the wholesale trade. The proportion of native women engaged in commercial

between the ports of Manila, southern Luzon, and the northern Visayas, in addition to considerable interests in Manila. His fleet of steamers furnishes Taal quick communication with Manila and the neighboring provinces. The trading class in Taal is efficient. During the recent shortage of rice Taal probably suffered as little as any other town in the Islands which imports the bulk of its rice. The merchants here brought in sufficient supplies at all times, and the price never became very dear. The people of Taal are always looking for a chance to buy land or a good location for a new store. (From a report by John H. Brown, Supervising Teacher, 1912.)

ventures is greater in the Philippine Islands than in most other countries of the world.

The relation of merchants to the Philippine agricultural classes does not end with the mere exchange of produce for articles of consumption. The merchants are in a position to advance new ideas in agriculture, to introduce and encourage new and remunerative crops, to establish standardization of products, to increase the standard of quality, and to create new markets. The retail merchants, especially, have a great opportunity; but thus far their effect on agriculture has been reactionary rather than progressive. Looking on trade from the narrow point of view of immediate profit, they have taken from the small farmers, by sharp methods and a pernicious advance of credit, all incentive to greater effort and production.¹ Buying without reference to grade, they have encouraged the production of inferior qualities of tobacco, abaca fiber, and copra.²

The use of more enlightened methods by retail merchants would hasten the industrial progress of the Philippines.

WANDERING TRADERS

The wandering traders are mostly Filipinos. In many well-populated districts peddlers are found who hawk their wares over a limited area. Many permanent merchants also send out goods in care of employees. From a few regions, where pressure of population is great, wandering traders do business over an extensive territory. The principal regions visited by the Ilocanos, Macabebes, Boholanos, and Taaleños are shown on Chart XLV. The Mariquina shoe peddlers and the peddlers of Iloilo are also encountered in a number of provinces, but these people do not wander far from their homes.

The Ilocano traders are often small landowners. They lease to others and sometimes mortgage their holdings to raise the

¹ See this chapter under the heading Credit (p. 428).

² On these products, see Chapters V, VI, VIII.

necessary capital to finance their trading ventures. During the tobacco harvest they go in great numbers each year to Cagayan. They sell Ilocano cloth, sugar, and native hats, and usually bring back tobacco, preserved fish, nito, rattan, and lumber, to vend in their own towns. Money passes twice, and two profits are thus made. Very little barter occurs in these enterprises. The merchants belong to the middle class, but take with them servants and dependents to peddle their wares. The commercial activities of the Ilocanos in the Central Plain of Luzon are not so important.¹

In Macabebe there are from eight hundred to a thousand persons engaged in traffic with other provinces. About two thirds of this number are engaged as cargadores, who are paid from ten to fifteen pesos a month besides subsistence.

Few of these traders, hardly ten per cent, have money of their own invested in their enterprise. About half of the whole capital is furnished on mortgage by a few wealthy men of Macabebe, with an annual interest ranging from twenty-five to sixty per cent; the rest is obtained from the Chinese merchants in Manila in cloths and other goods, in many cases without any security. Many of these traders are small landowners, whose relatives till their holdings in their absence.²

Wandering traders go from Taal also, and many of the permanent merchants there send out wandering representatives.

The activities of the Boholanos in northern Mindanao may be judged by the following description:³

A party of Boholanos leave their town in a banca owned in common. The men are usually owners of small amounts of land at home. They carry with them cloths of various kinds, steel articles of their own manufacture, nipa hats, ticog hats, loom-woven mats, fighting cocks, and general novelties. The first point of venture is generally some place where they can dispose of their goods for cash. They may leave their banca in a creek, and travel on foot, selling as they go. When they

¹ Report of G. Glenn Lyman.

² From a report by Benito Pangilinan.

³ By Lewis S. Thomas, Supervising Teacher, Misamis-Surigao.

have sold out, or believe that the trade will not absorb more, they go to some fishing point. In January the objective points are Cagayan and Tagoloan. There they lay in a load of salted hipon, sometimes catching the fish themselves, and then go on to Camiguin to sell it, and thence proceed homeward. Another banca may go to the mouth of the Agusan. Here the traders barter for salt fish, as well as sell goods. If time permits, they may go to some point where salt fish is needed, and sell their stock. At Opol, for instance, they will load up with earthen pots, which are salable all over the coast. These pots cost from ₱0.02½ to ₱0.10, and sell at from ₱0.05 to ₱0.20 in Camiguin. This is considered a good profit. A banca sells out its fighting cocks along the coast from Baliango to Iligan or Initao. Then it sets out for Cagayan. Here the traders may go up into the Bukidnon District to buy mats of sudsud, which yield a profit of a hundred per cent in Bohol. Another banca may sell out its goods at Medina, and lay in tobacco, which it sells at Cagayan and converts the money into salt fish. So the process goes on. At last the traders return to Bohol, loaded either with money or with salable articles.

The system followed in financing these expeditions is explained in the following description of the barrio of Guiwanon, town of Maribohok, Bohol:¹

An old man is the financier of the wandering merchants of this barrio, of whom there are more than a hundred. For more than twenty-five years he has been in the business of advancing them money and equipping them for their journeys, at the rate of twenty per cent for the money advanced and one third of the net profits of the venture. The barrio of Guiwanon is one of the most prosperous communities on this coast.

MONEY

Barter, the exchange of goods for goods, does not exist in the Philippines to the extent that might be supposed from the large number of primitive people found here. Trading is still carried on with the Negritos and semicivilized tribes; but even among them money is now employed as freely as in the lowlands.² It is only in the most remote districts,

¹ By Jacob G. Lang, Supervising Teacher.

² Commerce undoubtedly grew out of the exchange of gifts. That remnants of this idea still exist in the Philippines is indicated by the following

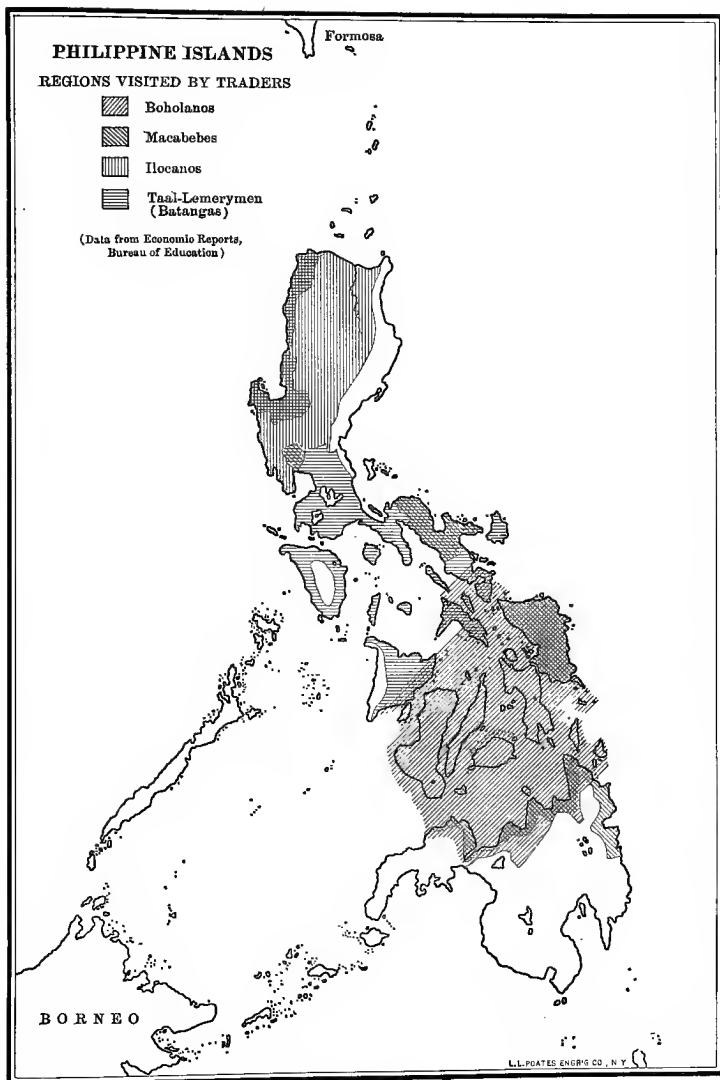


CHART XLV

where the influence of the government is felt the least, that barter is still the rule. In the Sulu Archipelago the only markets which the government has anything to do with are located at Jolo, Siasi, and Bongao. Almost every headman has a market day in his district at least once a week. On these days the people gather from miles round, bringing tapioca, fish, betel nuts, and fruits. These they exchange for whatever they need. Often a person with money can buy nothing at all here. Exchange is the custom in the markets, but in the three markets named above money is accepted as readily as exchange, since the markets are larger and the money may easily be turned into whatever is needed.¹

Among the Filipinos barter is carried on in the markets, and to some extent in the stores. Often chickens, eggs, and small quantities of farm produce are exchanged for oilcloth and the like. Barter is important in the marketing of export crops by small producers. These people often carry their tobacco, copra, or abaca to the tienda, and receive food, cloth, drink, and other articles for it.

As merchants are middlemen between producers and consumers, so money is the medium which acts between products sold and products bought. An essential quality of money is that it must possess value. The articles first utilized as money by a people are those most valued by them. Thus, throughout the Philippines rice was, and sometimes still is, used as money. Corn, pearl shell, and coconuts are less often

extract from the report of Lewis S. Thomas, Supervising Teacher, concerning the Bukidnons of Mindanao :

Barter among these people cannot be carried on unless certain conventions of friendship are first performed. It appears in all business with these people, even the Christians, that to sell a thing merely for the money is not honorable. There must be at least the fiction of a bond between the parties. In purchasing, the people will distinguish between barter (bailo) and exchange by means of money. "Ambit" is another word that is used even in cash purchases; it originally had the significance of a friendly act. "Palit" is the word for an out-and-out purchase for cash. The relationship between the seller and the buyer may thus be determined. While these distinctions are most marked in the mountains, traces of them may be seen among the Christian population.

¹ From the economic report of H. E. Stanton.

so used. In addition to its value rice is also portable, is not easily destroyed, and can be divided. These are essential features of money, and are possessed by metals in the highest degree.¹

When the Americans took over the government of the Philippines, two currencies were in existence, the Mexican silver dollar and the Spanish-Filipino peso and fractional coins. The value of these depended on the silver in them. The coinage of Europe and the United States is based on gold; since the relative value of silver and gold is constantly changing, the value of Mexican silver in United States currency fluctuated greatly. When silver was cheap, it took ₱2.66 to equal \$1 in gold; when silver was dear, it took only ₱1.98.

The differences in exchange from day to day were detrimental to trade, and a new Philippine currency based on gold was therefore coined. The unit of value in this currency is a theoretical gold peso consisting of 12.8 grains of gold nine tenths fine. This is half the amount in the theoretical gold dollar of the United States (no gold dollar is coined). The Philippine peso is silver, and the value of the metal in it has usually been less than the face value of the coin. The full face value is guaranteed, however, by the gold-standard fund, a reserve of more than \$7,500,000 kept by the government for that purpose. The Philippine peso should therefore maintain a constant exchange value of \$0.50 gold.²

¹ Care must be taken to distinguish the mere bartering of rice for other products from its use as money. As money, it serves as a medium of exchange, a measure of value, and a standard of deferred payment. If rice is exchanged for another product, the value of both being first reckoned in pesos, the exchange is merely barter. When rice acts as money, it is not only readily received in exchange for goods and given in exchange for other goods, but the value of other things, such as pigs, is reckoned in it, and debts are contracted in its terms and are paid with it.

² A few years ago the value of silver began to rise. The amount of silver in a Philippine peso has at two periods been worth more than \$0.50, and each time people began shipping pesos and fractional currency to China. To stop this, the currency was recoinced; the size of the coin or the amount of silver in it was made smaller.

Philippine bills are silver certificates issued either by the Treasurer of the Philippines, upon actual silver or gold coinage deposited in the Treasury, or by the banks. In 1919 about ₱100,000,000 in bills of ₱2 or more were in circulation, and ₱27,000,000 in peso bills, silver, and minor coins. The circulation per capita was about ₱13, an increase from about ₱5 in 1909. In the United States, on the first day of November, 1919, the amount of money in circulation per capita was \$54.63.

CREDIT, INTEREST, AND BANKING

The amount of money necessary for the commercial needs of a country depends on (1) the amount used as a medium of exchange; (2) the amount held as a cash reserve by individuals to insure solvency; (3) the amount of credit given, and credit instruments (checks, notes, and the like) used.

Professor Hadley¹ gives two distinct cases in which the use of little money and much credit makes itself felt:

In very poor communities, where the obvious needs for consumption are great, money in the cash drawer seems an unnecessary luxury. People are apt to spend all they have, and trust to getting more when more is needed. In this way they overreach themselves. They leave too little for effective use as a medium of exchange. By spending every cent they possess, they hamper production and exchange by constantly keeping their cash reserves at too low a figure; somewhat as the improvident operative, who spends every dollar before he has earned it, keeps himself constantly in the power of credit stores which charge him an unfairly high rate for his accommodation. In a community of this kind we find an inadequate supply of money, a very low level of prices for cash, a much higher level of credit prices, and a commercial system so uncertain and cumbersome as to prevent people from serving one another most effectively and from selling their products in outside markets at the best advantage.

Another cause of scant money supply is exemplified in communities of active producers. Such people spend their money, not for immediate

¹ Hadley's "Economics."

personal consumption, but for various forms of capital which will tend to increase their wealth in the future. It is not because they are poor that they keep themselves scantily supplied with money, but because they hope to be rich by means of its investment. Where farms, railroads, factories, and other forms of productive enterprise seem to insure their owners a return of ten per cent, the temptation to use too much money in purchasing means of production and leave too little to serve as a medium of exchange is at times quite overwhelming. In such communities there is always an active attempt to develop a credit system which shall serve the place of money.

The first proposition is applicable to most parts of the Philippines, since there is found here a great deal of borrowing and extension of credit for consumption rather than for production. In retail trade the "vale," or promise-to-pay system, is predominant, and the results are exorbitant prices. Money lenders, buyers, and storekeepers lend money or advance products on promise of repayment in tobacco, abaca, sugar, copra, rice, or other products at prices much below their market value. Such transactions net the lender from twenty-five to a hundred per cent in interest; the borrower is often as much in the power of the lender as in the kasama system of land tenure.

Even where tangible security is given, the rates of interest are high. The pawning of jewelry (in which form much of the surplus wealth of the Filipinos has been kept) is a common way of securing credit. Even where mortgages are given on land, crops, animals, and other properties, the rates, in all but the most advanced commercial communities, have been from twenty-five to fifty per cent on yearly loans, and as much as a hundred per cent on short-time loans in small amounts. In Manila, where a good banking and credit system exists, loans on real property bear eight per cent annually.

Interest is a legitimate thing. Capital is productive, and its share in production is interest. No established agricultural activity in the Philippines can yield twenty-five per cent (much less a hundred per cent) on the capital invested and provide a just share for labor, rent, and the profits of the manager. Since much of the money borrowed and the credit extended

in the Philippines have to do with consumption (fiestas, tiding over the lack of food, and the like) it is well to consider some of the legitimate purposes for which capital may be borrowed :

1. The merchant may borrow on goods which he has forwarded, but on which he has not yet received payment ; or on goods for which he has paid, or for which he wishes to pay, but which are in transit or in stock. The action in both cases is in anticipation of selling the goods for the purpose of buying more goods. Acceptances are now one of the most important types of paper in business credit.

2. The manufacturer may borrow to improve his plant ; for instance, a sugar mill.

3. The agriculturalist may borrow to purchase more implements and animals, to extend his holdings or improve his land, to purchase seed, and to plant and harvest his crop. He may borrow on his crop either before or after it is harvested, to hold it for a higher price and at the same time have funds with which to cultivate his land again. In these instances wealth is borrowed for the purpose of producing more wealth, and earns interest.

Credit has been difficult to obtain, and interest rates are high in the Philippines for the following reasons :

1. The amount of capital here is not great.

2. Much wealth is borrowed for consumption rather than for production.

3. Money lenders take advantage of the ignorance and the antipathy of the borrowers.

4. The lack of clear title to lands, the chief form of wealth in the Philippines, prevents land from being good security for loans.

5. The lack of a banking and credit system results in hoarding wealth instead of using it to finance productive enterprises.

The first four considerations have already been discussed. Since the merchant stands between the producer and the consumer, and money between the seller and the buyer, so banks

stand between the lender and the borrower. The moneys which are reserved by banks are of two kinds:

1. Those given for safe-keeping for a long time, and for which the bank pays interest (savings banks).

2. Surplus moneys used to carry on business and to secure solvency. These are deposited and withdrawn at frequent intervals by individual owners, but remain at a fairly steady level in the bank (commercial banking).

In this way much surplus wealth of the community comes under the control of the banks, and is utilizable for the basis of a credit system. The bank borrows it from many people, combines it, and in turn lends a portion of it to producers on security.

Up to the last few years the banks of the Philippines were to be found in the ports of entry, and were doing a business connected only with the export and import trade. The great productive agricultural districts were, and still are to a great extent, without banking facilities of a legitimate kind. The government has taken the lead in the extension of banking by founding postal savings banks and the Philippine National Bank.

As yet, however, the Philippines have no adequate banking system. Such a system would include the present postal savings bank in every municipality, and a commercial savings bank in each important capital. These would take care of small savings. The banks of Manila and their branches at Cebu, Iloilo, and Zamboanga are adequate to handle the export banking business of the Islands. The domestic banking system is far from adequate. Loans to agriculturists are practically confined to the Philippine National Bank and the Bank of the Philippine Islands, and most of them are large loans negotiated through Manila. There should be in each important provincial capital and agricultural center a branch of the Philippine National Bank, or an allied bank which could receive commercial deposits and make loans to local agriculturists and merchants. Such loans would necessarily have to be

well protected as to titles and the value of securities. They could not be granted to many small farmers because of the lack of land titles. However, this could be arranged through rural credit societies. The bank might lend to the society on the legitimate banking security of several members, and the society could in turn lend to its members on personal security. The ₱1,000,000 appropriated by Act Number 2818 is to finance the breaking and cultivating of new rice and corn land. This amount should be increased several fold to provide capital for Philippine agriculturists, so that crops may be planted, harvested, and sold without the present difficulties of securing funds and the present loss from high rates of interest.

India has more than seventeen hundred credit societies, doing an annual business of £8,000,000 (₱80,000,000), with more than two hundred central banks from which these societies can secure lend of working capital; above these central banks are five apex banks which lend working capital to them. This system was not perfected in the first five or ten years; it grew with experience.

Such a system in the Philippines would result in great expansion in agriculture.

PRICE

Theoretically price is determined by demand and supply. Great demand tends to increase the price of an article, and small demand to lower it. Small supply tends to increase price, and large supply to lower it. This law is well illustrated by the small bargaining carried on in the Philippines. The seller places his first quotation above what he expects to get; the purchaser begins with a figure lower than he is willing to give. The one lowers, the other raises his offer until the price is determined. Just after harvest, when rice is abundant, the price is cheap; at planting, when the demand is great and the supply limited, the price rises. In 1909 the production of radishes in Pasig was large, and the price became low. The next year few radishes were planted, and prices advanced.

In Laoag the occupation of silversmithing was overcrowded until many smiths went to the Cagayan Valley, when the remuneration of those remaining was increased. Copra now offers an example of an article of which the increased supply has not kept pace with the demand, so that its price has steadily risen.

The price of indigo is relatively low because of the competition of large supplies of cheaper coal-tar colors. The discussion of the price of abaca fiber in Chapter V offers an excellent example of the adjustment of price by supply and demand. If the price of an article rises considerably above the cost of production, the result is a large output in anticipation of large profits; but the supply being increased above the demand, the price falls until increase in the demand thus created absorbs the augmented supply. In turn, the lower price discourages production, and the price again rises on account of smaller supply. At any given time the price of an article is determined by demand and supply; in the long run the price approaches the cost of the article plus a reasonable profit.

The nearer the approach to free competition, the more readily do demand and supply adjust themselves. Ignorance, custom, and monopoly tend to prevent free competition. The high rates of interest charged in the Philippines are not only the result of great demand in comparison with the available supply of capital, but are the result of the ignorance of the people, who are taken advantage of by the lenders. Immense profits were once made on articles traded to the wild tribes. In selling to persons of wealth it is customary to charge high prices. In some parts of the Islands the law of supply and demand does not seem to hold good, and prices are fixed by tradition. Extraordinarily high prices offered do not seem to stimulate production.

An effective combination of sellers or buyers is a monopoly. Prices are set by such a combination. In the old government monopoly of tobacco the buying of tobacco was fixed by the officials. As explained in Chapter V, it is sometimes thought

that the low prices paid for abaca have been the result of a combination of buyers. At one time a monopoly of transportation existed in the Philippines, particularly in the abaca regions. A farmer having brought his produce to the coast had either to sell it at a low price to the representatives of the steamships, or to keep it, as no other transportation could be had to Manila. In 1903, and again in 1911-1912, shortage in the crop caused large importations of rice. A few merchants got control of the supply, and advanced the price far above the point where supply and demand would have placed it. This monopoly was broken by the government, which imported rice and sold it at a legitimate profit. On the other hand, in 1919 the government fixed the highest prices at which rice could be sold, and later seized the whole commercial supply of rice and corn, establishing a monopoly of the entire stock, to insure a sufficient supply to the people at a reasonable price. The government monopolies of tobacco and rice were *fiscal monopolies*, the one for the purpose of raising revenue, the other for political purposes. The monopolies of the rice merchants and the hemp dealers were *commercial monopolies*. The Philippines have a *natural monopoly* of abaca.

SUGGESTIONS FOR REVIEW AND ORIGINAL WORK

SUGGESTIONS BASED ON THE TEXT

1. In general, of what does foreign commerce in the tropics consist?
2. Illustrate your answer by examples from Philippine trade.
3. Explain by a chart the four stages in the increase of the Philippine export trade.
4. Mention some future events that might increase or decrease this trade.
5. Explain the meaning of the expression "balance of trade."
6. Give some of the reasons why a country exports more than it imports.
7. Why it imports more than it exports.
8. What is a favorable balance and an unfavorable balance of trade?
9. Explain why an unfavorable balance of trade is really favorable to some countries.
10. Outline the history of Philippine export

trade with respect to the balance of trade. 11. Should the balance of trade be favorable or unfavorable in the long run?

12. The prosperity of the United States has, in general, depended on its crops. Now it also depends on the demand for its manufactures. Explain. 13. On what does the prosperity of the Philippines depend?

14. Make a chart showing the trade between the Philippines and the United States, and explain the growth of trade.

15. Explain how improvement in transportation increases the trade of any region.

16. Locate ten centers of transportation in the Philippines and the Orient, and explain in detail on what circumstances their importance in commerce depends.

17. In connection with making Manila a center of transportation and transshipment, it is proposed to create a Free Port Area on the Manila waterfront. Explain why this should be done, how it could be accomplished, and the results that might be expected.

18. An interesting point is brought out in a recent report of the Whangpoo Conservancy Board (Shanghai, 1918). In the report it is stated that modern devices will be used for unloading ships in Shanghai even if in terms of money it may be cheaper to use coolies. The reason is that the amount of capital represented by ships and docking facilities is great enough to make speed the first consideration; the coolies on low wages will not be employed because it takes them too long to do the work. Freight rates to Manila are high because of the delays in handling cargo there. Review page 379 and the above quotation, and suggest a way to remedy this condition.

19. The Chinese are the merchants of the Philippines. Reasons for their success. 20. The growth of the commercial spirit among the Filipinos. 21. The importance of merchants to production. 22. The wandering traders of the Philippines.

23. Propose some more economic system for the gathering of the Philippine products and their marketing than that now in use.

24. How commerce and industry were hampered by the currency in use before 1903.

25. Read page 384, and explain the meaning of the following quotation: "The total resources of the commercial banks of a country are a part of the circulating medium rather than a part

of the capital of a country. The distinction cannot of course be sharply drawn. It is a question how much savings are represented in total resources."

26. On page 97 a scheme for anticipating market demands for abaca is explained. It includes the purchase and storage of hemp against probable change in the market. Explain how the banks may be of assistance in this project.

27. You have a crop of sugar cane valued at ₱100,000. For labor, machinery, animals, sacks, materials, transportation, and other expenses connected with the production of sugar from your cane you require ₱25,000. You have a Torrens title to the land. How might you secure the money? 28. How if you had no Torrens title?

29. Suppose you wish to put some modern machinery on the land, how could you secure the money?

30. Suppose your sugar is in the warehouse in Iloilo waiting a turn in the market or for shipping space to become available. You need another ₱25,000 to prepare your land and plant it and make certain improvements. How might you secure the money?

31. The forms above are legitimate methods of banking on agricultural security. Explain some others that may occur to you.

32. If possible, secure descriptions of actual banking operations in your locality and classify them. 33. Explain why an importer needs to borrow money.

34. Differentiate between borrowing for consumption and borrowing for production, by giving examples. 35. Personal security as a factor in banking.

36. The difference between the objects and methods of a savings bank and those of a commercial bank.

37. Prepare a scheme of banking which would meet the needs of the Philippines. 38. Explain how it would help in the development of commerce and industry. 39. Outline the difficulties of establishing such a banking system.

40. On what do rates of interest depend? 41. Explain some of the conditions that have made rates of interest high in the Philippines. 42. What changes should reduce them?

43. Why has the volume of the importation of rice into the Philippines no relation to the price of rice? 44. Prove that it has none.

45. Explain why the United States is the chief user of agave fibers. Yucatan, in Mexico, produces most of the world's supply. It took advantage of this fact and established a monopoly of the growers, which arbitrarily increased the price several fold. Explain how this affected the price and production of maguey in the Philippines. 46. Do you think the price set by the monopoly in Yucatan could be continued? Explain.

SUGGESTIONS FOR THE STUDY OF LOCAL CONDITIONS

1. Dependence on commerce. 2. Transportation facilities. 3. Results of further improvements. 4. Transportation centers and markets. 5. Merchants. 6. Wandering traders. 7. Forms of barter. 8. Examples of credit, interest, and banking.

SUGGESTIONS FOR REPORTS FROM REFERENCES

1. Secure the necessary data from the latest annual report of the Collector of Customs, and bring Charts XXXVI, XXXVII, XXXIX, XL, XLI, XLII, XLIII, XLIV, down to the present. 2. Comment on these new figures.

3. From the latest annual report of the Treasurer of the Philippine Islands make a chart of the total bank loans, discounts, and overdrafts. 4. Compare this with Chart XXXVI, with respect to its relation to the total foreign trade.

5. A comparison of the foreign trade of the Philippines and the foreign trade of the United States; Cuba; Siam; the Dutch East Indies; Japan; China; Great Britain; India.

6. The tariff laws of the United States which give the Philippines a preferred market, and the tariff laws of the Philippines which give the United States a preferred market.

7. The foreign commerce of the United States and chances for increase in the commerce between the United States and the Philippines. (Brigham, pages 271-286.)

8. The commerce of the United States with her colonies and territories. (Brigham, pages 276-277, and latest reports of the trade of the United States.)

9. The trade between Great Britain and the Philippines. 10. Great Britain and China. 11. Great Britain and Australia.

12. The commercial and industrial development of Japan, and the increasing trade between Japan and the Philippines.

13. The roads, railroads, and waterways of the leading countries of the world. (Bishop and Keller, and other commercial geographies.)

14. The canals of the world in relation to commerce. (Bishop and Keller, and other commercial geographies.)

15. Land transportation in the Philippines. ("The Craftsman," Vol. III, page 221.)

16. Water transportation in the Philippines.

17. Water transportation in Manila. ("The Craftsman," Vol. III, page 97.)

18. The history of transportation in the United States. (Bishop and Keller.)

19. The public ownership of railroads in the Philippines.

20. How it has been provided for.

21. How the railroads now controlled by the government are administered.

22. The trade of Singapore, Hongkong, and Shanghai compared with that of Manila.

23. How the currency of 1903 was coined.

24. The causes which brought about the recoinage.

25. Philippine silver currency, and how the recoinage was carried out.

26. The Philippine National Bank notes of 20 centavos, 50 centavos, and ₱1 of 1917.

27. The silver-certificate-reserve account and the gold-standard fund. (Annual report of the Treasurer of the Philippine Islands.)

28. The bank notes of the Bank of the Philippine Islands and of the Philippine National Bank.

29. The circulation of money is often taken as the index of the prosperity and domestic commerce of a country. In 1917 the circulation per capita of the Philippines was about ₱12. Compare this with the circulation of other countries.

30. From the annual report of the Treasurer of the Philippines prepare a chart showing the total annual circulation since 1906.

31. Interpret this historically as a reflection of the domestic commerce of the Philippines.

32. Compare it with the export commerce.

33. From the annual report of the Treasurer of the Philippines prepare a chart showing the percentage of silver certificates and bank notes of ₱2 or more to the total circulation.

34. Explain how this represents increased purchasing power.

35. Explain the usury law of the Philippines. If possible secure a copy of the court records of a case tried under this law.

36. On what sort of security do bankers ordinarily make loans?

37. What forms of security may be accepted by the National Bank of the Philippines?

38. Why did the old Agricultural Bank of the Philippines fall short of meeting the needs of the country?

39. Define the following terms: discount, deposit, issue, loan, overdraft.

40. Describe the method of making a deposit in a postal savings bank.

41. How can you make a withdrawal?

42. Describe the method of establishing a checking account in a bank; a savings account; of obtaining a certificate of deposit.

43. Explain the difference between these two accounts.

44. Of what assistance is the checking account in promoting exchange?

Suppose you were saving ₱10 a month; how would you handle your savings until they reached the sum of ₱1000?

45. Mention various approved ways of investing ₱1000.

46. Why government supervision of banks is necessary, and how it is effected in the Philippines.

47. The regulations governing the formation of rural credit societies.

48. Their similarity to the turnuhans.

49. Have the class organize itself into a rural credit society.

50. Marketing. (Bishop and Keller.)

51. Government and commerce. Activities of the government of the United States.

52. Activities of the government of the Philippines.

SELECTIONS ON THE THEORY OF ECONOMICS TO BE APPLIED TO THE MATERIAL IN THE CHAPTER

1. Exchange:

The theory of exchange. (Bullock, pages 97-115.)

Metallic money. (Bullock, pages 116-122.)

Credit and its instruments. (Bullock, pages 123-128.)

Laws of money. (Bullock, pages 128-142.)

Government paper money. (Bullock, pages 143-149.)

Banks as institutions of credit. (Bullock, pages 149-158.)

Bimetallism. (Bullock, pages 158-166.)

Railroad rates. (Bullock, pages 208-216.)

Public control of railroads. (Bullock, pages 215-225.)

International trade. (Bullock, page 226.)

2. The Philippines have a natural monopoly of hemp. Why can they not sell abaca at any price they desire?

3. In 1919 the Philippine government created a monopoly of rice for the purpose of controlling the distribution of the available stock in the Philippines. Determine what the result of the prices fixed by the government was (*a*) as to the sale of rice through the usual channels, (*b*) on the planting and the production of rice. 4. Explain the difference between such a monopoly and a financial monopoly.

CHAPTER XIX

SUMMARY¹

COMPARISON WITH FORMER EUROPEAN CONDITIONS

BEFORE THE INDUSTRIAL REVOLUTION

The economic life of the Philippines is to-day predominantly national, with much of the old town economy and even domestic economy remaining. The Philippines are an agricultural country, with an extensive supplementary household manufacture. In many respects the conditions here resemble those of England and the Continent before the Industrial Revolution, about a hundred and fifty years ago.²

Up to this period the general character of industry was much the same as in the Middle Ages, or even earlier. Both agriculture and manufacture were still pursued by primitive methods; the farms were small, and the manner of cultivation unscientific. Indeed, in many parts of England there still remained the old common fields, which dated back to the days of the Norman Conquest and before it, and were cultivated by peasants who, in many respects, had not progressed much farther than their villein ancestors.

But the peculiarity of the tillage system was that each villager had his strips or patches of land in different parts of the common field, not in juxtaposition. This custom, doubtless a relic of primitive times, was the cause not only of endless inconvenience, but of the slow development of the science of agriculture. Disputes were constantly arising concerning the boundaries of the strips or the method of cultivation, and

¹ Mr. Herbert W. Krieger assisted in gathering historical data.

² Adapted from H. de B. Gibbins's "Economic and Industrial Progress."

there was no opportunity for anybody who was cleverer than his fellows to follow out a course of his own, or to indulge in agricultural experiments. Much time was lost in going from one field to another.

The domestic system was very general in England and on the Continent before the changes brought about by the Industrial Revolution. Manufactures were closely associated with agriculture, and the craftsmen spun and wove with spinning wheel and loom in their own houses, to which very often a small piece of land was attached. At one time the weaver had furnished himself with warp and weft, worked it up, and had taken it to the market himself for sale; but by degrees this system had become too cumbrous, and the merchants themselves gave out the yarn to the weaver, or in other cases got together a few looms in a village and had them worked under their own supervision.

Aside from the many villages there were towns. Citizenship in these towns depended on the possession of a home and land. People who lived outside a town were not granted many of the rights that its citizens possessed.

The occupations of the townsmen were, of course, more varied than those of the villagers. In addition to agriculture the townsmen carried on manufactures and trade. Trading was the principal thing that marked off the life of the townsmen as distinct from that of the villagers. Articles of home manufacture, such as cloth, leather, and arms, and goods of wood, metal, and leather, were sold; likewise foreign goods brought to the towns from the Continent were displayed for sale in the towns.

The so-called market towns disposed of the products of manufacture. The market towns sold mostly local produce. Town fairs, held at stated periods, were important for a time, and merchants came from far and near to display their goods. Such fairs were held at different periods, so that merchants could attend many of them.

THE INDUSTRIAL REVOLUTION

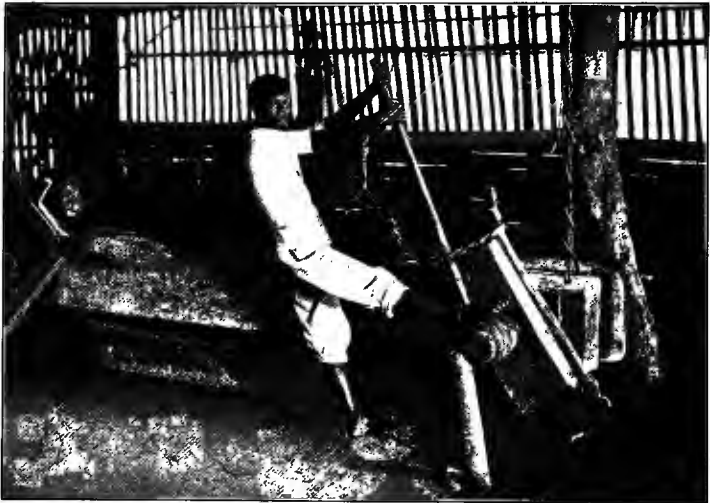
During the eighteenth century the old common fields, with their minute parcels of land, were gradually inclosed and turned into the trim and well-ordered private fields of the present day; but the old system was hardly dead at the close of the eighteenth century, although rapidly becoming obsolete. The last century, however, was remarkable for the growth and progress made in agriculture and stock-breeding by the methods of a few pioneers. It was the beginning, also, of the age of the capitalist-farmer and of large holdings in place of the peasant cultivator and his tiny patches. Indeed, without capital and large farms it is difficult to see how improvement could have taken place, at least with such rapidity.

Improvement in implements, the introduction of machinery, new crops and rotation of crops, all received their impetus during this period. The first of the great mechanical inventions of the Industrial Revolution had to do with spinning and the weaving of cloth. The first successful invention was the spinning jenny, in 1764, which was able to spin eight threads at a time. Improvements on this machine, greatly increasing its spinning capacity, were finally combined in the mule.

There remained to be invented a weaving machine that could keep pace with the increased possibilities in spinning. This was realized in the power loom. About the same time in America an apparatus was invented that was able to separate the cotton seeds from the fiber of the boll. Formerly this had to be done laboriously by hand. Cloth manufacture was now free to go forward unhampered, were it not for one difficulty; the repeated inventions had so increased the size of the spinning machinery that it could no longer be placed in the houses of the laborers. To work the machines by hand power was almost impossible. Special buildings were constructed, and horse power was employed. Later the buildings were placed by the side of streams, and water power was utilized.

The first steam engine to be used to supply power in a cotton mill was in 1785. It had been used earlier for other purposes.

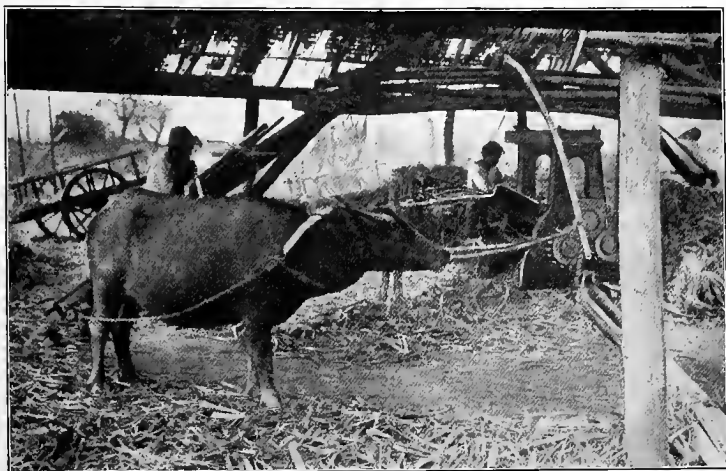
It was now necessary for laborers to leave their homes and work in factories. They did not possess enough means to set up their own factories, and capital was supplied by successful merchants or by the former owners of large estates. Since domestic manufacture was no longer profitable, the displaced



HUMAN POWER : AN OIL PRESS

hand workers gave up their small landholdings and went to the factory towns as wage laborers, or devoted themselves solely to the cultivation of their small holdings. Often they sold their land and became agricultural laborers.

Wood in England was well-nigh exhausted at the opening of the Industrial Revolution. As a result, the smelting of iron was on the decline. The use of coal in the reduction of the iron ore relieved the situation and stimulated new methods of coal mining. Its use for making steam caused factories to be founded in the proximity of coal fields. Many canals were



AN ANIMAL-POWER CANE CRUSHER



A WATER-POWER CANE CRUSHER
POWER

built, and great cities sprang up along them. Later the construction of steam railroads brought further change in the localization of the great centers of industry. Cities that had harbors were now connected by railroads with the mines and with the regions of agriculture and the raising of sheep.

The period of great inventions did not cease with the years immediately following the beginning of the Industrial Revolution, but have continued to the present time. The application of electricity to industry, and the use of fuel oil for power, are achievements of the modern age. Invention after invention is recorded annually in the history of the industrially progressive nations. The elements have been so completely mastered that the poorest laborer of to-day may in many respects live more comfortably and safely than could the lord of the manor in medieval ages.

RÉSUMÉ OF ECONOMIC ADVANCE IN THE PHILIPPINES

The Philippines are now going through an industrial revolution similar to the one which took place in England, except that the impetus has come from without, and that the achievements of other countries can be taken for guides and goals.

At the beginning of the seventeenth century Manila had come to be the commercial center of the Far East, and her merchants were in control of the commerce between the Orient and Spain and the Western World. The period of the brilliant success of Spanish effort in the East was brought to a close through the petty jealousy of the Spanish merchants at home. Only one vessel was permitted to ply between Mexico and the Philippines. The freight charges on this galleon were heavy, and served to raise the price of products to such a degree that an importer or exporter of goods for the Mexican and Philippine trade could realize a profit of several hundred per cent.

From the beginning of the seventeenth century Spanish dominion both in Europe and in her colonies began to decline. After the Mexican trade ceased, the new outlet of Philippine trade was Spain itself. The route was by way of the Cape of

Good Hope. Profits were now decreased, and trade became more extensive, since it was no longer a monopoly. Some few foreign business houses began operations in Manila, but under many restrictions. The wider market open to Philippine products stimulated the production of Manila hemp, sugar, and tobacco for export. In 1837 Manila became an open port for the ships of foreign nations. The cultivation of the staple export crops became still more extensive, and coffee and several minor crops, such as coconuts, made their appearance. In 1855 Iloilo and Zamboanga, and in 1863 Cebu, became ports of entry. These concessions to foreign trade were accompanied by a liberalizing of the customs duties. The prices of the export crops had so increased that it became profitable to the planter to introduce their cultivation and to purchase much of the rice required for the food supply.

The opening of the Suez Canal greatly stimulated the trade relations of the Philippines by shortening the distance between Europe and the East, and gave the Philippine planters an opportunity to compete with the more favorably situated countries.

The stagnant economic condition of the Philippines in the last decade of the nineteenth century is indicated by the dead level of foreign trade which existed through that period (see Chart XXXVI). The economic advance of the past decade is likewise indicated by an increase in foreign trade never before approached in the history of the Philippines. It has been occasioned by the removal of industrial restrictions, by encouragement to the economic independence of the individual, and by the opening of a market (the United States) for export products. Agriculture has been most affected, but manufacture (both factory and household), forestry, mining, and commerce have also progressed. The industrial growth of the Philippines will continue, and will be based on the natural resources, the supply of labor, and the amount of available capital. Although exports may fall off when world conditions become normal, the impetus given to Philippine industries by the war's demands will have a lasting effect.

PRESENT ECONOMIC TENDENCIES

Household manufacture dependent on agriculture will persist with the systems of peasant proprietor and share tenant. The drift is toward commercialism and the commission system, and the perfecting of old articles and the introduction of new wares for the United States market.

The growth of factories will occur in the larger ports of entry. At the present time the Philippines are hampered by



POWER: COAL IN BARGES, UNITED STATES

From Brigham's "Commercial Geography"

the lack of coal or other means of obtaining power. The Spaniards began to search for gold when they occupied the Islands, and later interested themselves in other minerals. Gold mining became important after the American occupation, but until recent times was rather speculative. At present there are some successfully operated gold mines and dredging properties. Should great finds be made in any of the Philippine mining regions, the resultant thronging of people to the new fields might settle certain sparsely populated regions, just as California, Australia, and Alaska were settled.

Although, so far as value is concerned, gold is the most

important mineral now produced in the Islands, there are deposits of many other minerals, both metallic and nonmetallic. The production in 1918 is noted in the following table:

ESTIMATED STATISTICS OF MINERAL PRODUCTION IN THE
PHILIPPINE ISLANDS IN 1917

[Approximations only]

	QUANTITY	VALUE
<i>Metallic</i>		<i>Pesos</i>
Iron, metric tons	50	18,000.00
Silver (alloyed with gold), fine grams	125,000	6,250.00
Gold, fine grams	2,119,000	2,816,638.37
Value of metallic		2,840,888.37
<i>Nonmetallic</i>		
Coal, metric tons	3,200	80,000.00
Clay products, metric tons		900,000.00
Lime, metric tons	14,000	270,000.00
Sand and gravel, cubic meters	725,000	700,000.00
Stone, cubic meters	230,000	350,000.00
Salt, metric tons	26,000	780,000.00
Mineral waters, liters	3,350,000	85,000.00
Value of nonmetallic		3,165,000.00
Grand total		6,005,888.37

The Philippines are chiefly an agricultural country, and the development of agriculture must require the principal attention and effort of the government and of the people in the years to come. The development of the mineral resources and of power, however, is not to be neglected. Act Number 2849 of the Philippine Legislature created the National Development Company. Its purpose is to engage in commercial, industrial, and other enterprises. The government is to hold the controlling shares; provincial and municipal governments, or the public, may have the remaining shares. The legislature has also created the National Cement Company, the National Iron Company, the National Petroleum Company, and the National Coal Company. Material for the

production of cement is found in the Philippines, although the one factory here has not yet been successful. Cement is particularly important in the Philippines, and its production here on a cheap and extensive scale would be of great assistance to industry. There are traces of petroleum in various parts of the Islands, but as yet little has been done in the way of investigation. The National Coal Company is the only one of these corporations authorized by law that was actively producing in 1919; it was operating in Mindanao. In addition private coal mines are being developed in various parts of the Islands. In 1918 the total import of coal into the Islands was about 405,000 metric tons, valued at more than ₱4,500,000. Most of our imported coal comes from Japan. The 3000 odd tons of domestic coal produced in 1917 seem to be trifling. Somewhat more was produced in 1918; the total possible output in 1919, even with the development of the mines noted above, was about 20,000 tons. It is evident, therefore, that there must be a large development of coal mines in the Islands to meet the demands. Moreover, it is probable that special methods of burning Philippine coal must be adopted, since the coal is very soft, and powders easily.

Countries like Italy, in which coal is lacking, have been able to develop electrical power. Japan is also a country in which the water power existing in the mountainous regions is converted into electrical power and transmitted to industrial centers. In the Philippines there are possibilities of developing electrical power, especially in regions which are not greatly affected by dry seasons, or in which water can be stored. The table of rice mills on page 33 indicates in a general way the provinces in which water power exists.

In the immediate future the factories needed will probably be similar to those already established to produce goods for domestic consumption (such as matches, cigarettes, and cottons), and to work up raw materials (for example, turning abaca into rope, copra into coconut oil, and tobacco into cigars).

In forestry, capitalistic methods of large production will soon supply domestic demands, and export will follow.

In agriculture the tendency to large estates in certain localities will probably be offset by the general desire of the Filipinos to become independent small farmers. It may be that ultimately the creation of educated professional and artisan classes will result in a movement leading away from the land, and the consolidation of small plots into larger holdings. On large and small holdings better methods and machinery are gradually finding their place. The agricultural laborer is receiving economic independence and greater incentive to produce, and the old forms of bondage are breaking down under education and enlightenment.

Greater production is taking place under the impetus of a profitable market in the United States.¹ The value of that market and the value of the Filipino as an agricultural laborer are being recognized in increased capitalistic agriculture. Foreign capital, particularly from the United States, is being invested in large estates purchased from private owners or leased from



POWER: BOTACAN FALLS

¹ The United States annually imports raw tropical products worth about \$1,000,000,000.

the government; domestic capital is also increasing. The increased products are being carried by an improved system of domestic transportation; better connections by steamers are being made with foreign countries.

The Philippines are a country of great potentialities. Modern methods, labor economically free, and sufficient capital are causing a wider and better use of the abundant natural resources and a greater production of wealth.

SUGGESTIONS FOR REVIEW AND ORIGINAL WORK

1. From the latest "Statistics on Principal Crops" of the Philippine Islands, Bureau of Agriculture, prepare a diagram representing the total area under cultivation. 2. Divide it into sections, one representing the area devoted to food crops, the other the area devoted to export crops. 3. Divide these again into sections representing the respective crops. 4. Make a similar chart representing the values of the crops. 5. Make a deduction from these diagrams as to the importance of various crops according to the area and the value. For example, add the areas devoted to food crops and their values; add the areas and values of export crops also; compare these and explain the relation of value to area on the importation of rice into the Philippines.

6. The general future agricultural prosperity of the Philippines.

7. Which product in your opinion has the greatest future, abaca, copra, tobacco, or sugar? 8. Which has the least chances of greater prosperity? 9. Have the Philippines such a complete monopoly of abaca that they can fix the price for it?

10. A comparison of the Philippines with England at the time of the Industrial Revolution.

11. On what do the present household industries of the Philippines depend? 12. The future of these industries.

13. Will the Philippines ever be a manufacturing country?

14. If the United States should adopt free trade, or the Philippine products should again have to pay duty on entering the United States, what would be the effect on Philippine industry?

15. Explain in detail. 16. The present tendency with respect to import tariffs in the United States.

17. The prosperity of the Philippines depends largely on the world's economic condition with respect to the demand for raw materials. Explain why, and give examples from the history of the abaca trade.

18. The revenue of the Philippine government, and how it is expended.

19. The organization and duties of the Bureaus of Agriculture, of Internal Revenue, of Forestry, of Commerce and Industry, of Education, with respect to the economic development of the Philippines.

20. Government aid to manufacturing enterprises in the Philippines.

21. Government aid to agricultural enterprises in the Philippines.

22. Government supervision and aid, and the resultant increase in the quality of hemp, maguey, tobacco, copra, and sugar.

23. Control of public utilities exercised by the Philippine government.

24. Secure from the Provincial Treasurer copies of the laws and regulations governing (a) postal savings banks, (b) the Philippine National Bank, (c) rural credit banks and societies. Discuss the activities of each of these institutions in promoting savings and in extending loans.

25. Wages in the Philippines (from the census of 1918).

26. Forms of increased wealth noted in the community.

27. Plans for the economic improvement of the province.

28. A review of Bullock's "The Elements of Economics," illustrating the economic theory by examples from economic conditions in the Philippines and other countries.

29. Bring in reports on the following subjects: the industrial development of the Philippines (a) during the Spanish period, (b) from 1900 to 1909, (c) from 1910 to 1914, (d) during the World War, (e) since the World War.

30. Write a paper or prepare a discussion on what the World War meant to the economic development of the Philippines.

31. In the table on page 454 compare the figures of the trade of Siam with those of the same period in the trade of the Philippines.

VALUES OF IMPORTS, EXPORTS, AND TOTAL TRADE OF SIAM FROM
1909 TO 1918

YEAR ENDED MARCH 31	POPULATION	IMPORTS	EXPORTS	TOTAL TRADE
1909	7,999,000	₹56,258,015	₹73,790,156	₹130,048,171
1910	8,007,000	57,580,266	75,401,668	126,721,704
1911	8,178,000	50,752,485	81,039,742	131,792,227
1912	8,266,000	53,765,997	62,215,925	115,981,928
1913	8,397,000	58,866,036	60,076,767	115,912,805
1914	8,449,000	67,764,387	86,223,878	153,988,265
1915	8,542,000	58,485,383	75,749,963	134,235,346
1916	8,636,000	56,358,810	79,160,144	135,518,954
1917	8,731,000	65,667,519	90,814,253	156,481,772
1918	8,827,000	72,569,637	92,542,026	165,111,663

NOTE. The values above are reduced from sterling (British currency), which is equivalent to \$4.8665, or ₹9.7330.

Population for 1918 estimated only.

32. International competition for industrial and commercial supremacy. (Keller and Bishop.)

APPENDIX I

TABLES OF EQUIVALENT WEIGHTS AND MEASURES ¹

[Conforming to Act No. 1519 of the Philippine Commission]

CURRENCY

₱1 Philippine Currency = \$0.50 United States Currency

LENGTHS

Units	Inches to milli- meters	Milli- meters to inches	Inches to centi- meters	Centi- meters to inches	Feet to meters	Meters to feet	Yards to meters	Meters to yards	Miles to kilo- meters	Kilo- meters to miles
1	25.4001	0.03937	2.54001	0.3937	0.304801	3.28083	0.914402	1.093611	1.60935	0.62137
2	50.8001	0.07874	5.08001	0.7874	0.609601	6.56167	1.828804	2.187222	3.21869	1.24274
3	76.2002	0.11811	7.62002	1.1811	0.914402	9.84250	2.743205	3.280833	4.82804	1.86411
4	101.6002	0.15748	10.16002	1.5748	1.219202	13.12333	3.657607	4.374444	6.43739	2.48548
5	127.0003	0.19685	12.70003	1.9685	1.524003	16.40417	4.572009	5.468056	8.04674	3.10685
6	152.4003	0.23622	15.24003	2.3622	1.828804	19.68500	5.486411	6.561667	9.65608	3.72822
7	177.8004	0.27559	17.78004	2.7559	2.133604	22.96583	6.400813	7.655278	11.26543	4.34959
8	203.2004	0.31496	20.32004	3.1496	2.438405	26.24667	7.315215	8.748889	12.87473	4.97096
9	228.6005	0.35433	22.86005	3.5433	2.743205	29.52750	8.229616	9.842500	14.48412	5.59233

AREAS

Units	Square inches to square centi- meters	Square centi- meters to square inches	Square feet to square decim- eters	Square decim- eters to square feet	Square yards to square meters	Square meters to square yards	Square miles to square kilo- meters	Square kilo- meters to square miles	Acres to hec- tares	Hec- tares to acres
1	6.452	0.1550	9.290	0.10764	0.836	1.196	2.5900	0.3861	0.4047	2.471
2	12.903	0.3100	18.581	0.21528	1.672	2.392	5.1800	0.7722	0.8094	4.942
3	19.355	0.4650	27.871	0.32292	2.508	3.588	7.7700	1.1583	1.2141	7.413
4	25.807	0.6200	37.161	0.43055	3.344	4.784	10.3600	1.5444	1.6187	9.885
5	32.258	0.7750	46.452	0.53819	4.181	5.980	12.9500	1.9305	2.0234	12.385
6	38.710	0.9300	55.742	0.64583	5.017	7.176	15.5400	2.3166	2.4281	14.246
7	45.161	1.0850	65.032	0.75347	5.853	8.372	18.1300	2.7027	2.8323	17.297
8	51.613	1.2400	74.323	0.86111	6.689	9.568	20.7200	3.0888	3.2375	19.768
9	58.065	1.3950	83.613	0.96875	7.525	10.764	23.3100	3.4749	3.6422	22.239

¹ By Dr. Alvin J. Cox, Bureau of Science.

MASSES

Units	Avoir- dupois pounds to kilo- grams	Kilo- grams to avoir- dupois pounds	Quintals to avoir- dupois pounds	Metric tons to avoir- dupois pounds	Arrobas to kilo- grams	Kilo- grams to arrobas	Piculs (or picos) to kilo- grams	Kilo- grams to piculs (or picos)
1	0.45359	2.20462	220.46	2,204.6	11.500	0.0870	63.250	0.01581
2	0.90719	4.40924	440.92	4,409.2	23.000	0.1739	126.500	0.03162
3	1.36078	6.61387	661.39	6,613.9	34.500	0.2609	189.750	0.04743
4	1.81437	8.81849	881.85	8,818.5	46.000	0.3478	253.000	0.06324
5	2.26796	11.02311	1,102.31	11,023.1	57.500	0.4348	316.250	0.07906
6	2.72156	13.22773	1,322.77	13,227.7	69.000	0.5217	379.500	0.09487
7	3.17515	15.43236	1,543.24	15,432.4	80.500	0.6087	442.750	0.11068
8	3.62874	17.63698	1,763.70	17,637.0	92.000	0.6956	506.000	0.12649
9	4.08233	19.84160	1,984.16	19,841.6	103.500	0.7826	569.250	0.14230

CAPACITIES

Units	Gallons to liters	Liters to gallons	Bushels to hecto- liters	Hecto- liters to bushels	Gantas to liters	Liters to gantas	Cavans to liters	Liters to cavans
1	3.78543	0.26417	0.35239	2.8377	3	0.33	75	0.0133
2	7.57087	0.52834	0.70479	5.6755	6	0.67	150	0.0267
3	11.35630	0.79251	1.05718	8.5132	9	1.00	225	0.0400
4	15.14174	1.05668	1.40957	11.3510	12	1.33	300	0.0533
5	18.92717	1.32085	1.76196	14.1887	15	1.67	375	0.0667
6	22.71261	1.58502	2.11436	17.0265	18	2.00	450	0.0800
7	26.49804	1.84919	2.46675	19.8642	21	2.33	525	0.0933
8	30.28348	2.11336	2.81914	22.7019	24	2.67	600	0.1067
9	34.06891	2.37753	3.17154	25.5397	27	3.00	675	0.1200

APPENDIX II

STATISTICAL TABLES

TABLE I. POPULATION OF THE PHILIPPINE ISLANDS BY PROVINCES IN ORDER OF DENSITY

PROVINCE	AREA ¹ IN SQUARE MILES	POPULATION					
		1903 ²		1915 ³		1918 ⁴	
		Number	Per square mile	Number	Per square mile	Number	Per square mile
City of Manila	20	219,928	10,996	266,246	13,312	280,460	14,023
La Union	350	137,839	217	148,459	424	156,390	447
Cebu	1,867	653,727	337	727,955	390	766,830	411
Ilocos Sur	442	187,411	398	170,877	387	180,000	407
Cavite	464	134,779	218	157,477	339	165,890	358
Pampanga	823	223,754	258	270,070	328	284,500	346
Pangasinan	1,944	397,902	334	535,025	275	563,600	290
Bulacan	1,007	223,742	191	251,249	250	264,790	263
Laguna	722	148,606	236	175,401	243	184,770	256
Batangas	1,270	257,715	215	286,643	226	301,950	246
Iloilo	2,040	410,315	202	454,911	223	479,200	235
Bohol	1,536	269,223	178	307,914	200	324,360	211
Rizal	913	150,923	206	180,527	198	190,170	208
Albay	1,543	240,326	135	292,157	189	307,760	201
Misamis	1,030	175,683	47	177,128	172	186,590	181
Capiz	1,710	230,721	132	286,927	168	302,250	177
Antique	964	134,166	118	159,870	166	168,410	175
Leyte	3,005	388,922	129	478,480	159	504,030	168
Ilocos Norte	1,293	178,995	135	185,446	143	195,350	151
Tarlac	1,178	135,107	112	167,738	142	176,700	150
Oriental Negros	1,902	201,494	108	265,202	139	279,360	147
Occidental Negros	3,125	308,272	98	414,113	133	436,230	140
Romblon	497	52,848	92	66,113	133	69,640	140
Batanes	74			8,685	117	9,160	124
Bataan	480	46,787	87	51,267	107	54,000	112
Ambos Camarines	2,851	239,405	73	293,012	103	308,660	108
Sorsogon	2,274	164,160	71	201,050	88	211,790	93
Nueva Ecija	2,069	134,147	62	168,026	81	177,000	86
Zambales	1,421	104,549	49	110,634	78	116,540	82
Cagayan	3,007	156,239	31	192,422	64	202,700	67
Samar	5,234	266,237	50	325,232	62	342,600	65
Tayabas	4,195	204,739	48	254,052	61	267,620	64
Mountain	6,447	95,495	36	387,388	60	408,070	63
Abra	1,475	51,860	44	65,170	44	68,650	47
Surigao	2,889	115,112	16	117,640	41	123,920	43
Isabela	4,052	76,431	15	98,748	24	104,020	26
Mindanao and Sulu: Sulu	1,082	120,768	78	110,548	102	116,450	108
Lanao	2,439			79,597	33	83,850	34
Zamboanga	6,383	67,899	15	124,869	20	131,540	21
Bukidnon	3,871			58,150	15	61,260	16
Davao	7,486	65,496	7	109,921	15	115,790	16
Agusan	4,294			59,690	14	62,880	15
Cotabato	9,620	125,875	11	97,661	10	102,870	11
Mindoro	3,983	39,582	10	63,777	16	67,180	17
Palawan	5,619	35,696	6	65,131	12	68,610	13
Nueva Vizcaya	3,530	62,531	32	34,665	10	36,520	11
Philippine Islands	114,420	7,635,426	67	9,503,271	83	10,010,810 ³	87

¹ Furnished by the Bureau of Lands.

² Census of 1903.

³ From Professor Beyer's "Population of the Philippine Islands in 1916."

⁴ Estimated on the basis of Professor Beyer's estimated population in 1918.

TABLE II. AMOUNT IN PESOS OF TOTAL TRADE (IMPORTS AND EXPORTS) BY COUNTRIES,
DURING THE YEARS ENDED DECEMBER 31, 1909-1918

	1918	1917	1916	1915	1914	1913	1912	1911	1910	1909
United States . . .	295,943,059	201,710,012	117,021,611	100,068,560	96,878,222	86,220,558	94,382,034	78,159,228	74,620,534	42,343,668
Hawaii . . .	958,872	968,859	648,267	561,638	741,318	1,444,244	606,858	920,414	322,186	116,500
Porto Rico . . .			22,376	30,654	20,688	24,764	41,794			702
Guam . . .	522,822	208,494	110,960	151,264	180,324	14,332	4,048	3,250	874	8,006
United Kingdom . .	44,492,210	26,532,640	30,001,039	24,976,237	23,419,290	28,889,472	29,805,762	24,715,660	26,875,776	21,431,190
Japan . . .	42,144,920	31,088,379	19,136,989	14,995,028	13,254,974	14,635,528	11,239,626	6,489,508	5,822,764	3,786,758
France . . .	4,097,446	4,506,617	7,047,646	12,609,292	9,991,784	13,862,032	20,375,748	18,877,066	17,668,064	11,592,278
Germany . . .	65,215	321,879	150,348	453,759	6,664,528	9,260,078	9,018,612	6,882,938	6,205,636	5,454,376
China . . .	19,632,486	12,839,167	9,705,062	7,905,655	7,211,756	7,661,436	6,027,866	5,083,316	6,634,614	8,234,286
Hongkong . . .	10,139,983	11,154,093	8,426,851	7,347,406	4,646,130	7,416,752	4,876,192	3,668,672	3,445,468	5,208,570
Spain . . .	7,860,335	4,981,013	6,667,658	7,022,441	6,899,624	7,382,858	7,965,024	6,779,342	6,965,246	7,018,844
Australia . . .	8,873,767	5,777,807	3,115,795	3,937,567	6,055,802	6,590,002	7,916,924	6,052,626	5,998,134	5,924,092
French East Indies .	16,860,839	11,309,048	13,019,776	13,832,462	6,279,490	5,439,842	22,802,178	13,710,512	13,368,394	9,441,736
British East Indies .	7,031,771	4,339,107	4,772,758	3,665,228	3,802,882	3,994,732	7,370,270	4,323,710	4,202,700	2,221,930
Belgium . . .	474	43,606	29,520	12,633	938,170	1,662,362	2,727,734	3,376,478	2,214,206	1,105,998
Switzerland . . .	1,215,741	1,120,127	1,323,645	1,781,097	1,063,984	1,501,794	1,296,350	1,030,580	1,392,676	1,644,064
Italy . . .	378,305	427,312	1,440,571	3,173,242	1,860,396	1,451,910	2,094,272	1,433,126	1,627,922	966,006
Dutch East Indies .	2,662,846	2,490,819	2,429,913	1,262,568	1,219,226	974,488	1,176,300	850,748	634,178	325,866
Siam . . .	2,439,348	753,449	658,949	642,343	691,036	954,680	732,488	935,766	261,486	807,526
Netherlands . . .	90,927	176,910	1,561,665	869,501	931,240	940,810	833,618	1,209,706	978,120	539,802
Austria-Hungary . .	1,663	2,063	7,360	38,397	463,748	703,222	923,618	1,209,706	896,558	
Japanese-China . . .	221,431	339,971	323,139	186,308	323,874	256,776	17,458	158,414	63,360	160,650
Norway . . .	15,476	29,858	447,053	208,080	277,976	221,422	180,318	188,828	284,272	60,666
Denmark . . .	1,400,341	1,119,188	1,379,272	121,895	96,756	195,172	119,264	188,828	120,492	81,490
Canada . . .	40,810	87,417	89,666	126,519	165,288	188,948	449,810	108,576	120,492	1,714
French Africa . . .	402,018	161,063	13,190	8,666	149,930	50,154	10,250	1,782	1,224	19,374
British Africa . . .	384,283	213,776	1,315,949	2,402	40,664	3,280	30,698	36,894	26,724	120,972
All other countries .				260,733	281,474	269,856	317,362	228,648	164,120	
Total . . .	487,587,387	322,802,674	230,887,040	206,250,376	194,656,574	202,171,484	233,182,402	185,723,068	180,695,648	132,017,512

TABLE III. VALUES IN PESOS OF IMPORTATIONS BY COUNTRIES OF ORIGIN, DURING THE YEARS ENDED DECEMBER 31, 1909-1918

	1918	1917	1916	1915	1914	1913	1912	1911	1910	1909
United States	117,649,222	76,241,295	45,725,346	52,762,138	48,022,802	53,352,522	48,618,020	38,313,974	40,137,084	12,890,662
Hawaii	670,472	615,247	378,061	316,093	502,488	1,189,694	262,788	775,170	122,932	742
Porto Rico			22,376	30,664	20,688	24,764	41,794			702
Guam	1,711	1,901	721	3,404	3,982	156		14		
United Kingdom	5,528,814	5,922,471	5,132,518	6,522,081	8,859,224	10,752,078	11,501,422	11,192,100	12,931,534	10,894,442
Austria-Hungary	1,663	2,063	7,360	38,397	298,090	322,534	453,134	388,944	277,920	197,488
Belgium		43,606	29,520	12,593	431,120	574,070	624,132	680,074	788,686	658,188
Denmark	40,810	87,417	83,246	126,519	162,022	161,898	153,228	100,688	116,832	80,110
France	1,613,301	1,575,749	1,267,191	1,501,865	2,197,218	2,896,328	2,882,736	2,297,488	2,292,490	2,110,460
Germany	65,215	321,860	150,262	453,623	4,505,100	5,776,852	5,666,356	4,282,098	4,759,050	3,632,544
Italy	89,295	192,790	207,313	301,847	383,356	459,190	466,782	354,320	320,532	310,366
Netherlands	90,927	176,910	281,068	295,339	265,008	366,768	390,536	2,391,046	392,268	447,260
Norway	934,412	1,406,958	1,709,893	1,838,206	2,386,950	2,477,844	2,866,518	2,891,046	2,994,266	2,831,822
Spain	15,475	29,858	447,053	208,080	277,570	221,422	180,318	158,182	63,360	150,600
Switzerland	961,012	753,974	957,831	1,585,720	1,041,790	1,403,584	957,044	933,228	1,150,888	1,065,178
Canada	64,950	28,560	12,220	28,515	92,180	180,984	100,252	35,506	181,202	80,382
China	13,153,925	8,514,651	5,286,755	4,662,162	5,007,176	4,369,302	3,851,194	3,993,090	5,153,152	5,224,064
Japanese China	204,462	280,007	254,870	183,232	317,018	255,228	17,422			
British East Indies	3,879,960	2,536,690	2,081,018	1,511,983	1,488,692	1,330,476	4,940,710	2,190,202	2,112,632	1,872,408
Dutch East Indies	1,784,907	2,000,172	2,011,134	1,142,204	1,100,698	852,084	1,093,304	767,564	523,390	874,474
French East Indies	13,956,086	10,481,580	12,811,043	13,766,141	6,262,480	5,415,274	22,783,444	13,687,802	13,345,790	9,419,676
Hongkong	113,655	385,566	220,557	404,588	594,296	1,058,916	1,663,244	1,650,680	1,179,726	880,392
Japan	26,208,111	16,432,436	9,439,375	7,434,536	7,267,284	6,786,490	6,103,380	3,356,106	5,287,900	3,242,006
Siam	2,310,255	708,984	622,549	594,880	641,990	929,376	719,242	921,480	230,086	301,758
Australia	7,388,480	3,597,266	1,776,519	2,819,226	4,850,502	5,356,180	6,746,230	5,124,392	5,006,950	4,967,722
British Africa	389,928	159,093	12,144	456	45,222	12	26,348	19,404		3,452
French Africa			616	862			2,346	1,204		306
All other countries	82,275	96,957	63,732	79,579	151,548	110,178	213,878	113,988	69,052	61,706
Total	197,198,423	131,594,061	90,992,675	98,624,367	97,177,306	106,625,572	123,335,802	96,048,814	99,438,722	62,168,838

TABLE IV. VALUES IN PESOS OF EXPORTATIONS BY COUNTRIES OF DESTINATION,
DURING THE YEARS ENDED DECEMBER 31, 1909-1918

	1918	1917	1916	1915	1914	1913	1912	1911	1910	1909
United States	178,293,837	126,468,717	71,296,265	47,306,422	48,855,420	32,868,086	45,764,014	39,845,254	34,483,450	29,453,026
Hawaii	288,400	353,612	269,206	245,545	238,830	254,550	224,070	145,244	196,254	115,758
Guam	521,111	206,593	110,239	147,860	176,342	14,176	4,048	3,236	874	5,006
United Kingdom	38,963,396	20,610,169	24,868,521	18,454,206	14,560,066	18,137,394	18,304,340	13,523,560	13,944,242	10,536,748
Austria-Hungary	474				165,658	380,688	470,484	113,346	618,638	342,316
Belgium					507,050	1,088,292	2,103,602	2,796,404	1,424,520	1,563,742
Denmark			6,420		3,266	7,050	296,582	2,888	3,660	1,380
France	2,484,146	2,830,868	5,780,473	11,107,027	7,794,566	10,965,704	17,493,110	16,579,578	15,375,594	9,471,828
Germany		19	84	136	2,153,428	3,483,198	3,362,256	2,600,840	1,446,586	1,821,832
Italy	289,010	234,522	1,233,258	2,870,395	1,477,040	992,720	1,627,490	1,013,056	1,307,390	1,333,698
Netherlands			1,280,597	574,162	666,232	574,042	443,080	855,386	585,852	380,266
Spain	6,925,923	3,474,055	4,957,763	5,184,235	4,512,674	4,905,014	5,098,506	4,388,266	3,970,980	4,187,022
Norway				406				332		50
Switzerland	254,729	366,153	365,814	195,377	22,194	98,230	279,306	97,352	141,788	40,820
Canada	1,335,391	1,090,628	1,367,052	93,380	4,626	14,188	19,012	153,322	103,070	10,334
China	6,498,561	4,324,516	4,418,307	3,243,493	2,204,580	3,292,134	2,176,672	1,090,226	1,481,462	3,010,232
Japanese China	16,969	59,964	68,269	3,076	6,856	1,648	66			
British East Indies	3,151,811	1,802,417	2,691,738	2,153,245	2,314,190	2,654,256	2,429,560	2,133,508	2,090,068	1,549,328
Dutch East Indies	878,839	490,647	418,779	120,364	118,528	122,404	82,996	83,184	110,788	91,532
French East Indies	2,604,753	827,468	208,733	66,322	17,010	24,568	18,754	22,710	22,504	21,752
Hongkong	10,016,328	10,768,527	8,206,294	6,942,831	4,081,834	3,817,836	3,212,948	2,017,992	2,265,742	4,328,178
Japan	15,936,809	14,655,943	9,697,614	7,660,492	5,937,690	7,849,068	5,136,246	1,133,402	534,864	548,752
Siam	192,093	44,465	36,400	47,363	49,046	25,284	13,246	14,276	31,400	24,108
Australasia	1,485,287	2,380,541	1,339,276	1,118,341	1,205,309	1,233,822	1,170,694	928,234	991,184	956,370
British Africa			1,046	1,946	1,442	3,268	4,250	17,490	26,724	13,922
French Africa	12,090	116,819	1,252,217	8,050	149,068	48,766	7,904	578	1,224	1,408
All other countries				181,154	139,926	149,678	103,484	114,660	95,068	59,266
Total	270,388,964	191,208,613	139,874,365	107,626,008	97,379,268	95,545,912	109,846,000	89,674,254	81,256,926	69,848,674

APPENDIX II

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TABLE V. VALUES IN PESOS OF PRINCIPAL ARTICLES EXPORTED DURING THE YEARS
ENDED DECEMBER 31, 1909-1918

NAMES OF ARTICLES	1918	1917	1916	1915	1914	1913	1912	1911	1910	1909
Copra	10,377,029	16,654,301	14,231,941	22,223,109	15,960,540	19,091,448	28,366,932	26,039,124	21,278,098	15,345,730
Coconut cake	7,255	36,999	45,921		233,624	2 219,150				
Coconut oil	63,328,317	22,818,294	7,851,469	6,641,003	5,238,366	2,292,678	80	87,252	32	68,254
Cordage	1,733,968	788,974	236,245	189,799	172,028	124,402	85,336			
Embroideries	4,361,352	3,929,318	2,328,024	735,303	324,912	352,338	207,270			
Hats	1,183,446	1,390,833	1,313,226	514,138	627,762	817,878	925,114	880,492	557,826	478,180
Knotted hemp	1,578,869	1,880,159	1,065,317	611,493	1,141,574	1,131,402	1,722,370	843,976	4 705,404	
Hemp	116,383,100	93,615,559	53,364,593	42,678,200	38,389,630	42,242,168	44,151,342	38,970,254	32,950,622	33,792,000
Magnety	3,736,108	4,696,493	3,479,978	1,070,407	834,114	1,181,902	1,098,584	587,112	405,186	576,994
Shells:										
Black lip pearl	6,163	2,326	20,750	15,836	28,456	2 22,036				
Golden lip pearl	347,210	233,084	269,405	242,941	287,216	2 416,634	396,974	296,250	237,168	224,650
Trocha	83,384	6,043	119,463	222,986	232,514	2 75,862				
Green snail	75,641	43,174	93,533	120,748	132,476	2 237,050	253,198	237,196	191,536	51,768
Sugar	31,608,780	24,555,357	37,175,185	22,620,430	22,119,186	14,065,778	19,600,680	22,151,346	14,448,770	11,216,574
Tobacco:										
Cigars	14,233,437	9,589,192	5,688,751	4,114,605	4,630,318	6,024,468	6,184,128	3,803,726	5,519,322	3,509,058
Cigarettes	231,941	113,014	99,483	84,990	77,446	95,830	109,820	62,674	81,280	42,058
Other tobacco	12,685,248	4,599,875	5,864,115	3,210,273	3,647,300	3,813,638	4,432,816	3,769,762	3,217,360	3,097,952
Lumber:										
Almon	79,250	106,147	30,821	72,106	1 88,958	2 34,284				
Lauan	157,474	157,452	248,056	16,368						
Tangle	231,873	341,683	529,119	333,981	335,698	286,040	84,022	11,892	4 2,136	
Other lumber	170,392	218,214	173,292	48,096	194,872	302,990	151,846	47,832	4 35,224	
Pili nuts	577	1,058	23,576	23,576	44,624	2 188,270				
Pearl buttons	181,330	224,630	144,282	161,481	122,234	2 77,346				
All other domestic mer- chandise	1,965,902	1,902,583	2,101,284	1,569,887	1,407,780	1,667,852	1,467,480	1,385,694	1,167,666	1,176,648
Exports of foreign mer- chandise	5,640,918	3,324,851	3,208,678	1,104,252	1,107,640	784,468	608,608	499,672	391,714	268,808
Total	270,388,964	191,208,613	139,874,365	107,696,008	97,379,268	95,545,912	109,846,600	89,674,254	81,256,926	69,848,674

¹ Not separately stated prior to January 1, 1915.

² Not separately stated prior to July 1, 1913.

³ Not separately stated prior to July 1, 1912.

⁴ Not separately stated prior to July 1, 1910.

TABLE VI. VALUES IN PESOS OF PRINCIPAL ARTICLES IMPORTED DURING THE YEARS
ENDED DECEMBER 31, 1909-1918

NAMES OF ARTICLES	1918	1917	1916	1915	1914	1913	1912	1911	1910	1909
Agricultural implements, and parts of	320,394	142,710	97,161	102,754	70,898	67,144	120,526	97,700	114,410	118,180
Carabao	34,728	82,689	115,092	203,719	133,114	5,332	651,860	796,370	1,819,132	
Other cattle	198,349	350,298	359,179	838,163	483,532	331,876	860,484	1,150,032	1,828,524	1,708,854
Books and other printed matter	1,211,292	971,559	939,525	815,892	939,092	1,060,932	1,229,022	786,932	921,418	376,618
Brass, and manufactures of	728,988	569,089	350,830	384,670	455,772	508,464	543,702	429,432	487,492	350,990
Wheat flour	6,033,528	3,831,050	3,002,883	3,892,607	3,222,316	3,797,908	4,266,654	3,013,718	3,108,478	2,564,898
Other breadstuffs	1,115,074	885,158	919,287	1,325,095	868,012	1,211,010	1,928,412	882,788	1,667,178	834,616
Automobiles and parts, including tires	6,525,665	3,080,801	2,705,145	1,949,638	2,026,902	2,526,804	1,842,384	1,456,204	1,633,104	
Other cars, carriages, vehicles, and parts of	549,489	490,161	487,189	634,571	947,824	1,175,760	1,051,062	1,029,628	841,456	491,070
Cement	996,855	596,513	586,200	817,060	1,108,764	1,623,384	1,036,456	1,260,802	1,201,616	615,878
Chemicals, drugs, dyes, and medicines	3,341,434	2,862,248	2,776,148	1,730,658	1,447,582	1,438,180	1,668,826	1,267,896	1,268,680	1,027,352
Coal	4,862,349	3,076,470	2,607,988	2,865,041	3,499,490	3,168,134	2,133,328	2,436,050	3,358,578	1,252,698
Cocoa or cacao	992,459	905,054	811,026	469,480	663,808	604,242	733,608	492,374	446,118	402,356
Coffee	748,017	837,252	690,332	484,781	694,768	719,912	802,258	678,326	566,892	402,180
Copper, and manufactures of	518,442	443,360	251,484	250,302	267,754	425,208	334,458	319,644	399,384	180,708
Cotton, and manufactures of	58,016,844	37,574,006	18,649,772	23,582,828	19,912,488	23,688,602	22,238,324	18,463,840	20,970,102	14,389,360
Diamonds and other precious stones, and imitations of, unset	1,199,781	712,299	468,802	410,254	439,722	850,866	597,760	776,316	1,348,874	
Earthen, stone, and china ware	879,314	553,543	398,690	284,505	326,578	366,836	391,552	428,358	397,566	274,416
Eggs	968,346	680,706	681,803	829,134	822,730	764,490	709,938	673,806	588,778	580,868
Fibers, vegetable, and textile grasses, and manufactures of	4,724,325	3,071,808	1,241,175	1,197,361	1,494,356	1,003,128	1,135,530	890,968	999,968	745,068
Fish and fish products	6,212,350	1,855,736	1,120,021	832,288	1,441,470	1,691,580	1,344,552	1,196,956	1,346,232	907,286
Fruits and nuts	1,239,940	823,204	773,934	710,546	810,546	772,334	890,124	706,274	663,194	518,686
Glass and glassware	1,747,445	950,781	661,208	541,566	586,638	636,542	715,968	608,368	592,908	384,420

Gold, platinum and silver, and manufactures of	435,399	202,665	184,237	172,472	223,896	316,850	382,416	307,898	181,506	172,282
India rubber, manufactures of (auto tires excluded)	1,163,118	682,232	701,717	594,332	570,288	578,786	670,756	685,838	504,150	303,512
Instruments and apparatus	2,218,768	1,893,907	1,361,024	1,500,493	1,657,422	1,989,678	1,645,270	1,185,440	733,062	277,962
Iron and steel, and manufactures of	24,507,970	11,855,125	7,226,477	8,860,142	13,966,898	17,227,808	12,436,668	12,357,378	11,118,916	4,792,152
Leather, and manufactures of	4,171,064	3,247,817	2,119,337	2,549,605	3,115,648	2,106,896	2,548,926	1,836,926	2,241,840	1,184,850
Meat products	4,128,539	2,850,873	2,271,487	3,442,474	3,732,548	4,106,500	5,062,148	3,688,726	3,770,612	2,920,014
Dairy products	2,671,032	3,129,238	1,985,908	2,199,682	2,236,546	2,422,530	2,509,264	2,025,748	1,940,658	1,349,170
Musical instruments, and parts of	236,163	134,333	142,736	129,192	197,972	190,056	223,292	192,278	196,754	215,898
Illuminating oil	2,426,920	2,673,335	2,025,691	2,258,030	2,562,040	2,536,088	2,786,646	2,280,974	1,847,512	2,006,250
Other oils	3,168,282	2,914,882	2,631,525	1,801,020	1,587,668	1,689,230	1,503,772	1,194,624	888,656	490,960
Paints and pigments	1,391,785	663,743	511,227	575,031	384,022	467,172	593,972	527,786	634,384	318,782
Paper, and manufactures of	3,683,982	3,778,373	1,789,886	1,522,421	1,514,380	1,638,874	1,772,112	1,499,054	1,594,030	1,052,904
Perfumery and all other toilet preparations	664,373	712,129	433,055	537,012	415,860	363,642	450,860	320,140	362,806	274,238
Photographic equipment and supplies	265,886	203,686	198,933	192,111	206,546	214,020	201,200	183,768	171,290	108,158
Plated ware, gold, and silver	1,135,415	591,105	246,633	189,363	241,954	357,364	255,780	215,366	105,200	9,588,018
Rice	10,433,585	10,781,463	13,043,642	13,448,551	6,552,296	6,329,182	26,017,012	13,544,494	11,982,670	1,073,990
Silk, and manufactures of	5,727,024	3,961,187	1,769,963	1,805,574	1,698,876	1,672,644	1,827,328	1,537,212	1,488,780	1,73,868
Soap	693,265	1,163,630	630,319	962,197	1,170,724	762,952	636,780	437,106	338,202	1,255,468
Spirits, wines, and malt liquors	806,394	656,613	708,477	631,040	700,104	721,134	944,138	985,860	937,104	314,890
Sugar and molasses	84,612	86,624	163,742	417,672	560,690	727,130	761,040	559,370	487,232	161,818
Tobacco, and manufactures of	1,569,330	1,178,446	849,002	784,583	614,586	617,792	490,482	354,546	448,518	1,237,466
Vegetables	2,436,088	1,823,970	1,477,624	1,428,883	1,590,678	1,559,910	1,605,818	1,473,956	1,377,162	135,814
Wax	361,800	289,644	287,080	233,339	148,154	327,414	292,450	201,794	158,834	718,638
Wood, and manufactures of	1,772,346	1,098,429	616,996	672,432	1,543,578	1,541,264	1,601,038	1,224,068	2,029,573	285,588
Wool, and manufactures of	1,743,095	855,827	295,304	529,525	760,404	654,780	849,076	609,528	645,050	3,831,946
Other imports	11,338,782	8,918,291	6,389,819	6,028,633	6,568,454	7,297,276	7,948,576	6,839,862	9,846,672	62,168,838
Total	197,198,423	131,594,061	90,992,675	98,624,367	97,177,306	106,625,572	123,335,802	96,048,814	99,438,722	62,168,838

1 Not separately stated prior to July 1, 1910. Government and railway free entries excluded prior to year 1910.

TABLE VII. IMPORTS, EXPORTS, TRADE, AND BALANCE

YEARS ENDING DECEMBER 31	IMPORTS	EXPORTS	TOTAL TRADE	BALANCE OF TRADE	
				Favorable	Unfavorable
1899 . . .	P38,385,972	P29,693,164	P38,079,136		P8,692,808
1900 . . .	49,727,558	45,980,746	95,708,304		3,746,812
1901 . . .	60,324,942	49,006,706	109,331,648		11,318,236
1902 . . .	66,684,332	57,343,808	124,028,140		9,340,524
1903 . . .	67,622,768	64,793,492	132,416,260		2,829,276
1904 . . .	59,155,462	58,299,000	117,454,462		856,462
1905 . . .	60,101,100	66,909,548	127,010,648	P6,808,448	
1906 . . .	52,807,536	65,285,784	118,093,320	12,478,248	
1907 . . .	60,907,620	66,195,734	127,103,354	5,288,114	
1908 . . .	58,372,240	65,202,144	123,574,384	6,829,904	
1909 . . .	62,168,838	69,848,674	132,017,512	7,679,836	
1910 . . .	99,438,722	81,256,926	180,695,648		18,181,796
1911 . . .	96,048,814	89,674,254	185,723,068		6,374,560
1912 . . .	123,335,802	109,846,600	233,182,402		13,489,202
1913 . . .	106,625,572	95,545,912	202,171,484		11,079,660
1914 . . .	97,177,306	97,379,268	194,556,574	201,962	
1915 . . .	98,624,367	107,626,008	206,250,375	9,001,641	
1916 . . .	90,992,675	139,874,365	230,867,040	48,881,690	
1917 . . .	131,594,061	191,208,613	322,802,674	59,614,552	
1918 . . .	197,198,423	270,388,964	467,587,387	73,190,541	

TABLE VIII. RICE IMPORTED FROM 1899 TO 1918

YEARS ENDING DE- CEMBER 31	QUANTITY IN METRIC TONS	VALUE	AVERAGE VALUE PER 100 KILOS	PERCENTAGE OF TOTAL IMPORTS
1899	110,142	P7,047,382	P6.40	18.36
1900	145,838	8,730,112	5.99	17.56
1901	170,648	10,216,682	5.99	16.94
1902	290,057	17,568,776	6.06	26.35
1903	334,339	25,104,764	7.51	37.12
1904	265,754	15,421,508	5.80	26.07
1905	219,274	13,491,950	6.15	22.45
1906	127,053	7,983,826	6.28	15.12
1907	119,024	8,333,488	7.00	13.68
1908	158,385	11,105,142	7.01	19.02
1909	167,125	9,588,018	5.74	15.42
1910	197,326	11,982,670	6.07	12.05
1911	183,675	13,544,494	7.37	14.12
1912	301,057	26,017,012	8.64	21.09
1913	86,990	6,329,182	7.28	5.94
1914	96,921	6,552,296	6.76	6.74
1915	218,442	13,448,551	6.16	13.63
1916	189,836	13,043,642	6.87	14.33
1917	146,986	10,781,463	7.33	7.95
1918	183,726	16,433,585	8.94	8.33

TABLE IX. HEMP EXPORTED FROM 1899 TO 1918

YEAR	TO ALL COUNTRIES			PERCENT- AGE OF TOTAL EXPORTS	TO THE UNITED STATES		
	Quantity in kilos	Value in pesos	Value (1,000 k.)		Quantity in kilos	Value in pesos	Value (1,000 k.)
1899 . .	70,152,768	15,987,148	P227.89	53.8	27,140,408	6,031,452	P222.23
1900 . .	90,869,008	26,580,800	293.62	57.8	20,628,864	5,593,336	271.14
1901 . .	126,245,112	31,953,280	253.10	65.2	30,821,376	8,314,626	269.77
1902 . .	113,284,000	38,581,220	340.57	67.3	61,350,144	22,178,760	361.51
1903 . .	139,956,032	44,001,176	314.39	67.9	71,030,952	23,524,880	331.19
1904 . .	123,583,192	41,883,354	338.95	71.9	60,352,432	21,373,792	354.15
1905 . .	130,437,128	43,514,688	338.61	65.0	72,919,336	25,296,286	346.91
1906 . .	104,078,024	39,225,264	376.88	60.1	56,756,808	22,311,100	393.10
1907 . .	117,241,320	39,378,986	335.88	59.5	52,454,048	18,633,078	355.22
1908 . .	131,382,008	33,003,912	251.21	50.6	61,309,504	15,595,852	254.38
1909 . .	167,953,119	33,792,000	201.20	48.4	101,533,184	20,868,082	205.53
1910 . .	163,173,211	32,950,622	201.93	40.6	75,528,081	16,794,620	222.36
1911 . .	148,202,047	28,970,254	195.48	32.4	63,580,150	15,535,580	212.89
1912 . .	175,137,180	44,151,342	252.10	40.2	76,006,058	21,558,274	283.64
1913 . .	119,821,435	42,242,168	352.54	44.2	47,144,252	19,574,432	415.20
1914 . .	116,386,575	38,389,630	329.85	39.4	50,140,193	19,238,752	383.69
1915 . .	142,010,431	42,678,200	300.53	39.7	69,251,180	22,702,566	327.83
1916 . .	137,326,092	53,384,593	388.70	38.1	66,344,154	27,279,018	411.17
1917 . .	169,435,204	93,615,559	552.51	48.9	95,580,320	59,291,095	620.32
1918 . .	169,260,377	116,383,100	687.60	42.9	86,823,997	65,468,402	754.04

TABLE X. QUANTITIES AND VALUES OF HEMP EXPORTED

GRADE	1918			1917		
	Quantity in kilos	Value in pesos	Value (1,000 k.)	Quantity in kilos	Value in pesos	Value (1,000 k.)
AA—Tagal-one . .	1,197,266	1,906,891	P1,592			
BB—Tagal-two . .	1,241,412	1,749,842	1,409			
CC—Tagal-three . .	1,195,339	1,527,438	1,277			
DD—Tagal-four . .	510,362	582,179	1,140			
EE—Tagal-five . .	254,003	259,071	1,019			
A—Extra prime . .	15,814	22,948	1,451	1,152,643	1,770,216	P1,535
B—Prime . .	124,226	129,789	1,044	2,360,567	3,085,422	1,307
C—Superior current . .	1,343,553	1,247,232	928	5,943,069	6,330,932	1,065
D—Good current . .	6,512,034	5,835,297	896	6,675,611	7,044,859	917
E—Midway . .	16,089,876	13,591,183	844	14,996,615	11,917,408	794
S1—Streaky No. 1 . .	1,533,051	1,207,766	787	2,003,547	1,293,279	645
S2—Streaky No. 2 . .	4,959,654	3,564,988	718	4,868,491	2,838,663	583
S3—Streaky No. 3 . .	3,121,197	2,018,510	646	2,593,126	1,429,240	551
F—Current . .	26,828,819	19,669,308	807	24,151,154	17,118,331	708
G—Seconds . .	5,261,173	3,248,785	617	5,738,246	2,591,037	451
H—Brown . .	3,518,181	1,997,284	567	3,355,923	1,419,070	422
I—Good fair . .	23,252,039	17,025,853	732	18,297,299	9,826,569	537
J—Fair . .	42,873,205	25,737,681	600	23,995,466	10,390,369	433
K—Medium . .	11,514,270	5,724,690	497	10,011,423	3,523,462	351
L—Coarse . .	9,316,510	4,428,486	475	19,854,724	6,383,368	321
M—Coarse brown . .	3,314,527	1,188,962	358	6,853,837	2,046,681	298
DL—Daet coarse . .	1,256,910	419,705	333	7,386,935	2,167,502	293
DM—Daet coarse bwn	590,512	150,061	254	3,443,999	948,030	275
Y—Damaged . .	524,475	217,315	414	579,464	137,811	237
O—Strings (white) . .	766,469	262,356	342	522,670	126,380	241
OO—Strings (dark) . .	495,421	138,933	280	397,321	71,601	180
T—Tow . .	1,408,968	329,202	233	1,863,973	281,794	151
Hemp sliver . .	106,008	91,364	861			
Various grades . .				569,124	320,293	562
Hemp treated with oil	135,103	109,981	814	819,977	553,242	674
Total	169,260,377	116,383,100	P687	169,435,204	93,615,559	P552

TABLE XI. COCONUT OIL EXPORTS TO ALL COUNTRIES

YEAR	KILOS	VALUE
1912	P 660	P 80
1913	5,010,429	1,146,339
1914	11,943,329	2,619,183
1915	13,464,169	5,641,033
1916	16,091,169	7,851,469
1917	45,198,415	22,818,294
1918	115,280,847	63,328,317

TABLE XII. COPRA EXPORTS TO ALL COUNTRIES, AND TO THE UNITED STATES, FROM 1899 TO 1918

YEAR	TO ALL COUNTRIES			PER-CENTAGE OF TOTAL EXPORTS	TO THE UNITED STATES		
	Quantity in kilos	Value	Average value per 1,000 kilos		Quantity in kilos	Value	Average value per 1,000 kilos
1899 .	15,353,175	P1,453,306	P94.65	4.9			
1900 .	64,890,953	6,364,962	98.08	13.8	103,234	P8,900	P86.21
1901 .	32,517,773	3,223,676	99.13	6.6			
1902 .	59,226,854	5,403,450	91.23	9.4	58,995	18,114	307.04
1903 .	82,154,170	7,639,586	92.99	11.8	176,156	18,708	106.20
1904 .	38,572,325	3,962,244	102.72	6.8	102,576	12,850	125.27
1905 .	55,748,625	6,489,406	116.40	9.7	102,504	16,000	156.09
1906 .	60,585,955	8,747,404	144.38	13.4	377,626	70,200	185.90
1907 .	58,622,437	9,568,302	163.22	14.4	2,109,002	395,116	187.35
1908 .	97,494,971	12,117,772	124.29	18.6	3,780,141	441,784	116.87
1909 .	109,033,203	15,345,730	140.74	22.0	5,943,618	844,356	142.06
1910 .	120,483,808	21,278,098	176.60	26.2	7,138,109	1,277,566	178.98
1911 .	142,147,546	26,039,124	183.20	29.0	15,209,138	2,756,690	181.25
1912 .	142,792,929	28,366,932	198.65	25.8	21,192,866	4,043,106	190.78
1913 .	82,219,363	19,091,448	232.20	20.0	10,027,813	2,398,166	239.15
1914 .	87,344,695	15,960,540	182.73	16.4	18,181,371	3,212,266	176.68
1915 .	139,092,902	22,223,109	159.77	20.6	21,217,754	3,520,090	165.90
1916 .	72,277,164	14,231,941	196.90	10.1	35,470,438	7,079,128	199.57
1917 .	92,180,326	16,654,301	180.67	8.7	68,253,929	12,235,902	179.27
1918 .	55,061,736	10,377,029	188.46	3.8	55,061,641	10,377,011	188.46

TABLE XIII. SUGAR EXPORTS TO ALL COUNTRIES AND TO THE UNITED STATES FROM 1899 TO 1918

YEAR	TO ALL COUNTRIES			PER- CENT- AGE OF TOTAL EX- PORTS	TO THE UNITED STATES		
	Quantity in kilos	Value	Average value per 1,000 kilos		Quantity in kilos	Value	Average value per 1,000 kilos
1899	85,827,565	P6,919,420	P80.62	23.3	21,887,428	P1,778,910	P81.27
1900	65,190,951	4,794,288	73.54	10.4	2,153,477	186,944	86.81
1901	56,872,593	5,112,626	89.89	10.4	5,225,989	586,708	112.27
1902	98,596,473	6,692,300	67.87	11.7	5,120,133	400,000	78.12
1903	85,307,972	6,650,468	77.95	10.3	29,315,374	2,271,652	77.49
1904	87,053,051	6,185,504	71.05	10.7	25,897,940	1,741,248	67.23
1905	108,498,717	10,146,466	93.51	15.2	43,591,777	4,204,046	96.44
1906	129,453,709	9,108,184	70.36	13.9	11,857,594	844,222	71.19
1907	127,917,216	8,391,342	65.64	12.7	10,989,024	807,702	73.50
1908	144,735,001	11,407,282	78.81	17.5	46,706,756	3,932,332	84.19
1909	129,327,880	11,216,574	86.73	16.1	53,072,968	5,299,208	99.85
1910	121,471,544	14,448,770	118.94	17.8	100,700,037	12,428,452	123.42
1911	209,044,397	22,151,346	105.96	24.6	187,658,886	20,204,206	107.66
1912	197,075,995	19,600,680	99.45	17.9	133,878,621	14,010,228	104.65
1913	157,333,707	14,065,778	89.40	14.7	30,716,889	3,128,072	101.83
1914	236,498,001	22,119,186	93.10	22.7	169,530,115	16,483,706	97.23
1915	211,012,817	22,620,430	107.20	21.0	82,841,168	10,283,159	124.13
1916	337,490,000	37,175,185	110.15	26.5	131,885,246	17,267,401	130.90
1917	205,908,492	24,555,357	119.25	12.8	62,377,758	10,811,518	173.32
1918	273,258,396	31,608,780	115.67	11.6	106,080,676	16,559,780	156.11

TABLE XIV. TOTAL TOBACCO EXPORTS TO ALL COUNTRIES

YEAR	TOTAL VALUE	PERCENTAGE OF TOTAL EXPORTS
1909	P 6,649,060	9.6
1910	8,818,962	10.8
1911	7,635,762	8.5
1912	10,726,964	9.9
1913	9,933,946	10.0
1914	8,355,064	8.5
1915	7,409,868	6.9
1916	11,652,349	8.5
1917	14,301,801	7.3
1918	27,150,626	10.0

TABLE XV. CIGARS EXPORTED TO ALL COUNTRIES AND TO THE UNITED STATES FROM 1899 TO 1918

YEAR	To ALL COUNTRIES			PER- CENTAGE OF TOTAL EXPORTS	To THE UNITED STATES		
	Quantity in thousands	Value	Average value per 1,000		Quantity in thousands	Value	Average value per 1,000
1899 .	196,090	P1,891,398	P9.65	6.4	708	P6,810	P9.62
1900 .	172,659	2,316,834	13.42	5.0	1,376	11,324	8.23
1901 .	238,475	3,664,898	15.37	7.5	72	1,816	25.22
1902 .	117,852	1,977,036	16.78	3.4	698	22,012	31.54
1903 .	118,947	1,922,710	16.16	3.0	107	3,800	35.51
1904 .	104,753	2,011,790	19.21	3.5	57	2,092	36.70
1905 .	95,739	1,785,122	18.65	2.7	728	28,228	38.77
1906 .	108,635	2,008,014	18.48	3.1	1,690	59,340	35.11
1907 .	114,665	2,126,764	18.55	3.2	1,526	48,400	31.72
1908 .	115,881	2,118,656	18.28	3.2	1,182	36,752	31.09
1909 .	151,457	3,509,058	23.17	5.0	37,076	1,474,792	39.78
1910 .	184,407	5,519,322	29.93	6.8	61,526	3,121,598	50.74
1911 .	134,830	3,803,726	28.21	4.2	38,112	1,804,756	47.35
1912 .	190,842	6,184,128	32.40	5.6	90,000	3,916,642	43.52
1913 .	191,762	6,024,468	31.42	6.3	71,513	3,285,776	45.95
1914 .	154,753	4,630,318	29.92	4.8	56,205	2,400,252	42.71
1915 .	134,648	4,114,605	30.56	3.8	61,170	2,302,444	37.64
1916 .	193,026	5,688,751	29.47	4.0	111,478	4,066,242	36.47
1917 .	284,525	9,588,192	33.69	5.0	202,199	7,725,966	38.20
1918 .	359,665	14,233,437	39.57	5.2	248,748	11,365,675	45.69

TABLE XVI. STATISTICS ON THE PRINCIPAL CROPS OF THE PHILIPPINE ISLANDS FOR THE YEAR ENDING JUNE 30, 1918

Compiled from the official reports submitted by municipal officers

CROPS	AREA CULTIVATED HECTARES	PRODUCTS	AMOUNT PRODUCED	AVERAGE PRICE IN MUNICIPAL MARKETS	VALUE OF COCONUT, SUGAR CANE AND CORN PRODUCTS IN MUNICIPAL MARKETS	TOTAL VALUE IN MUNICIPAL MARKETS
Rice	P1,368,140	Rough rice	2,684,628,424 liters	P .0503	—	P135,163,375.42
Abaca	512,508	Abaca (Manila Hemp)	166,863,644 kilos	.5540	—	92,493,223.58
Coconuts	335,602	Ripe nuts as food	91,612,157 nuts	.0863	3,327,786.27	
(average of 200 trees		Copra	346,656,535 kilos	.1335	46,280,782.61	
per hectare)		Coconut oil	4,555,330 liters	.2966	1,351,191.71	
		Tuba (a beverage)	83,922,804 liters	.0664	5,574,032.43	
		Total value of all coco- nut products				
Sugar cane	205,511	Crude sugar	396,242,786 kilos	.0914	36,241,529.53	56,533,793.02
		Panochas (small cakes)	34,442,908 kilos	.1090	3,783,546.05	
		Basi (a beverage)	7,106,785 liters	.0758	539,119.21	
		Molasses	5,085,989 liters	.1169	594,584.02	
		Total value of all sugar cane products				
Corn	418,386	Shelled corn	397,177,773 liters	.0530	21,018,647.99	41,158,778.81
		Forage	9,487,857 kilos	.0370	353,475.30	
		Total value of all corn products				
Tobacco	78,443	Tobacco leaf	61,555,322 kilos	.2470	—	*21,372,125.29
Magney	32,601	Magney (cantala)	16,664,736 kilos	.2200	—	15,219,155.38
Cacao (estimated)	1,142	Cacao	566,200 kilos	.9200	—	3,707,213.49
Coffee (estimated)	768	Coffee	721,855 kilos	.6170	—	520,670.01
Total	P2,953,101	—	—	—	—	445,983.26
						P366,614,316.26

TABLE XVII. FACTORIES AND INDUSTRIAL ESTABLISHMENTS IN THE CITY OF MANILA IN 1915¹

(Source: Bureau of Labor)

Factories and Establishments	Number	Value of Output in 1915	Number of Laborers Engaged				Average Daily Hours of Labor
			Male	Female	Children under sixteen years	Total	
Aërated water	9	P248,460	136	16	3	155	9
Bacon	1	12,000	5			5	10
Bed	1	112,288	25		3	28	9
Bread, biscuit, and sweetmeat bakeries .	46	1,603,079	615			615	8.8
Breweries	2	1,745,000	196	36		232	9
Button	1		180	20		200	9
Candle	9	759,821	46			46	9
Candy	11	366,513	131			131	9
Caramel	14	756,646	89			89	10
Carpentry shops . . .	54	224,011	147			147	9
Carriage shops and iron works	41	153,123	268		1	269	9
Chocolate	29	318,305	99	3		102	8
Cigar and cigarette .	32	11,777,591	4,961	3,465	448	8,874	9
Coffee grinding mills .	2	15,400	4			4	9
Comb	3	13,131	7			7	9
Dried and smoked fish	27	689,614	120	7	1	128	9
Drug	1		11	3		14	9
Dyeing establishments	4	15,754	19			19	7
Electric power plants .	1	1,536,457	214			214	9.5
Fertilizer ²	1	4,061	8			8	
Fish traps ²	17	4,955	52			52	
Foundries, iron works and machine shops .	52	549,734	425			425	9
Furniture	23	744,518	304		3	307	9
Gas plants	1	243,998	89			89	8
Hat and umbrella . .	15	1,429,671	316	149	31	496	8.5
Ice plants	3	221,684	84			84	13
Ink ²	1	692	1			1	
Line	2	12,979	4			4	9
Machine shops, foundries and shipyards .	1	512,866	325		3	328	9.5
Match	1	374,000	123	100	30	253	9
Musical instruments .	12	16,795	24			24	8
Oil ³	1	189,208	21			21	8
Preserved foodstuff .	6	20,000	15	55		70	9

¹ Latest available data.² Without definite hours.³ In 1918 there were 18 oil factories.

TABLE XVII. — (Continued)

Factories and Establishments	Number	Value of Output in 1915	Number of Laborers Engaged				Average Daily Hours of Labor
			Male	Female	Children under sixteen years	Total	
Printing and binding of books	43	P633,171	617	41	19	677	8
Rice mills	2	1,141,608	59	7		66	13
Rope	2	106,000	78	30	27	135	8
Sails constructing	4	27,578	13			13	9
Saw-mills	21	1,584,937	636		1	637	9
Sculpture and marble cutting shops	18	74,603	93		1	94	9
Shoes, slippers and other leather goods	172	1,328,987	800	40	2	842	8
Soap	40	1,023,378	143		1	144	8
Soup-paste and sauce	13	163,859	86	9		95	9
Spinnery	1	22,400	12			12	9
Tanneries	7	272,184	37			37	10
Tile and brick	2	66,977	50			50	8.5
Tin shops	51	299,113	118			118	9.5
Trunk, harness and other leather goods	9	192,927	120	1		121	9
Weaving	1	214,000	105	100	8	213	11
Wheel	2	10,349	5			5	(²)
Wine and liquor distilleries	11	2,490,561	160	20	1	181	9
Total	823	34,324,986	12,196	4,102	583	16,881	

¹ Production of 20 saw-mills only.² Without definite hours.

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